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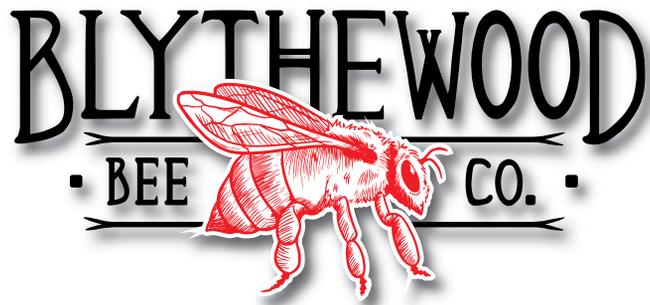
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POSTMASTER: Send address changes to
BEE CULTURE, The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Subscription Information

U.S., one year, \$25; two years, \$48. Newsstand price: \$4.99. All other countries, (U.S. Currency only), \$20.00 per year additional for postage. Digital Edition \$15. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), March 2017, Volume 145, Issue 3, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Subscriptions, Book Orders – 800.289.7668, Ext. 3220 • www.BeeCulture.com • subscriptions@BeeCulture.com

Advertising – 800.289.7668, Ext. 3216; JNewcombe@BeeCulture.com

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A good size NE Ohio swarm. Photo by Kim Flottum.

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¹Charistos, L, Parashos, N & Hatzina, F (2015) Long term effects of a food supplement HiveAlive™ on honey bee colony strength and Nosema ceranae spore counts, Journal of Apicultural Research. ² Increase in honeybee populations with continued use of HiveAlive, Results from long-term field trials, France 2014-2015, Trial conducted by Veto-Pharma, France ³Flourence, J. (1999). Seaweed proteins: biochemical, nutritional aspects and potential uses. ⁴ Kovač, D (2013) Algae in food and feed. Journal of the Institute of Food Technology in Novi Sad ⁵ Lovstad Holdt & Stefan Kraan, Bioactive compounds in seaweed... ⁶ Mayer, A., & Hamann, M. (2004). Marine Pharmacology in 2000: Marine compounds with antibacterial, anticoagulant, antifungal...

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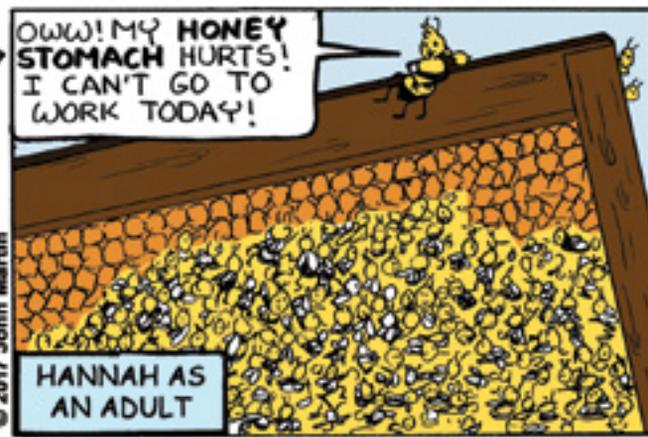


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Goats

I have to respond to Jennifer Louque's remarks to goats. I can tell that she does not know anything about goats. This is not critical but informative. If you give them a chance they are fussy eaters. If someone tells you that goats eat tin cans and paper, report their owners to the animal cruelty society.

Fifty years ago when our kids were small my wife wanted to get a goat for the kids as a pet. I had a fit, I was raised on a farm and we had cows and my dad was from a family of dairy farmers and goats were a nasty word. I finally gave in and we bought a little goat (kid). Somehow I decided they weren't so bad after all. I ended up buying a herd of goats and our kids (children) grew up on goat's milk. I never knew anyone that would turn down homemade ice cream made with goat's milk. Goat's milk is naturally homogenized. And goat's meat is sweet. My dad that thought goats were so evil ate some goat's meat not knowing what it was said it tasted sweet. So anyone that thinks that goat's meat sounds gross I know that they have never eaten any. Maybe an old billy goat maybe but we never tried one of those.

Chickens will preferably eat out scratching around in a manure pile to eat. You will never find a goat eating from one of those. I kept them in with just two electric wires, one about a foot off the ground and one about three feet off the ground. I never had a goat out. I have chased so many cows that had gotten out that I don't have time to count them all.

What does this have to do with bees. Well I got tired of feeding this stinky billy goat so I sold him and there was a lady that had two or three billies so when I need their services. I would trade a jar of honey for the services of her billy, so we both were happy.

Richard Brenner
Vicksburg, MI

anyone interested in more info on raising goats email pb.orley@brenner@gmail.com

More About Goats

I always enjoy Jessica Louque's column, but in the January 2017 issue she wrote something that got my hackles up in her article on being prepared for disasters, where she mentions in passing, "I think goat meat is gross."

I wonder if she's ever had the pleasure of eating goat meat.

My family raises dairy goats (you gotta love the milk, yogurt, and ice cream!), and sometimes we harvest a young goat for meat. On our farm we also harvest venison. If I'm lax about labeling packages destined for the freezer, we can't much tell the difference between goat meat and deer meat.

I'd a far sight rather eat clean tasting goat or deer meat that has been swiftly harvested, than beef from the grocery store that tastes (to our family, anyway) like "fear."

Think about this - Why do you think so many restaurants, and recipes, for beef include multiple herbs and spices and marinades? When was the last time you had a steak at a restaurant that wasn't "steeped in our signature marinade?"

Gimme goat meat any day of the week. And please pass the biscuits, butter, honey!

Gail Damerow

Varroa Mite

I enjoyed M.E.A McNeil's in the January issue article and love the graphic of the computer-wise mite!

Yep an interesting journey with this mite creature. I manage

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Anyways, thanks for the article. I enjoyed it! I wish you and yours a great New Year!

Rick Samyn
St. Leo/L'Arche Beekeeping

Not Happy

I'm not happy with the very cheap 2017 calendar.

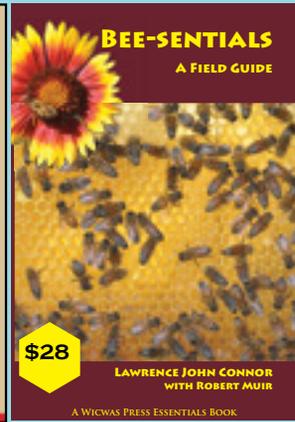
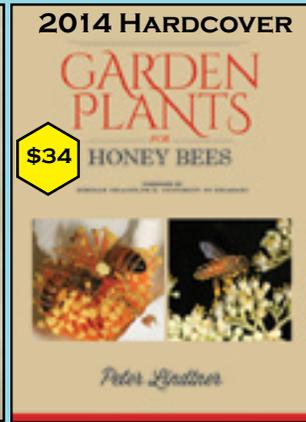
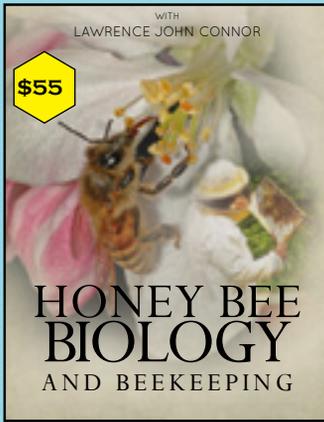
Mike Foti

Editor's Note: We appreciate all comments about our work here at Bee Culture. It would be easy to only publish the positive comments, but we try to give equal time to constructive criticism. We do our very best to create an attractive calendar with the many photos that we receive, while at the same time keeping costs down. Thank you for your comments and we do hope you are using and enjoying your 2017 calendar.

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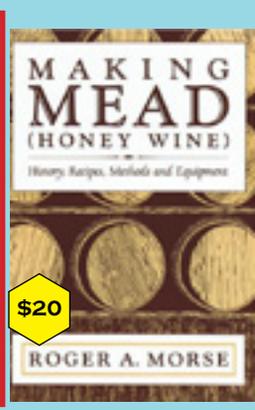
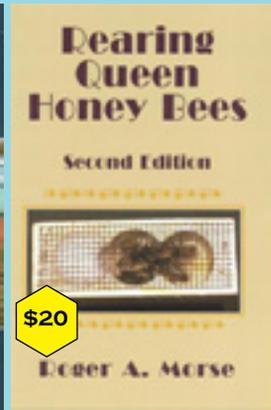
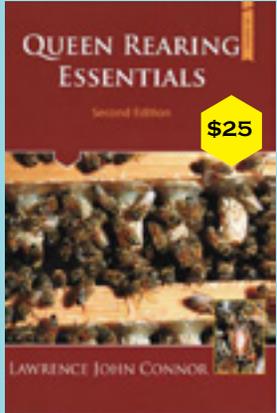
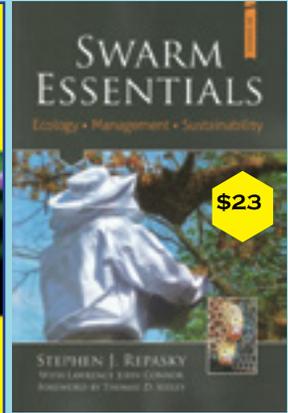
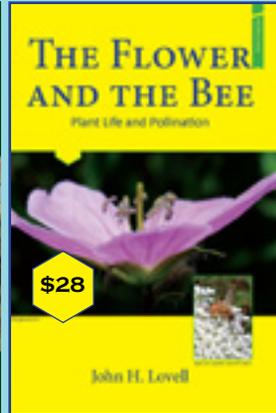
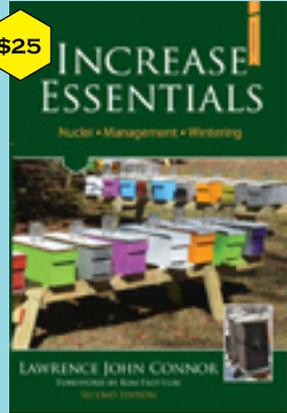
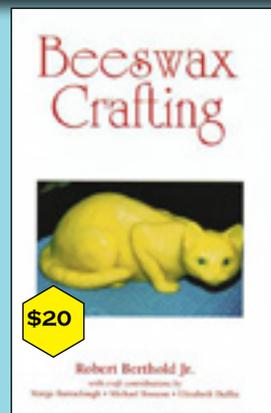
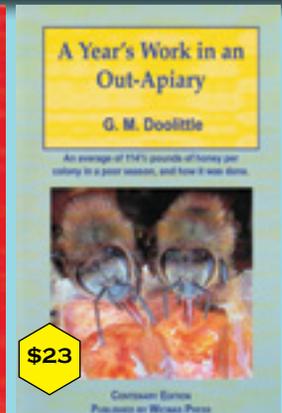
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New Winter Reading –

The Boy Scout, The Beekeeper and The Bees, by Terry R. Combs published by Outskirts Press, Inc. ISBN 9781478761600. 7.4" x 9.7", 277 pgs. Black & White Paperback available at Amazon and Barnes & Noble and www.outskirtspress.com/the-boyscoutthebeekeeperandthebees \$29.95.

If you've always wanted to start beekeeping but didn't know where to begin, this is the book for you. There's good information about how to start beekeeping, and how to expand and refine your craft. Based on the solid protocol of the Boy Scouts of America Beekeeping Merit Badge, this guide takes you through many levels of beekeeping. Whether you're interested in producing honey, helping the environment, or investing in a fascinating and rewarding hobby.

This book is about telling as it has minimal photos. But the telling is instructive without lots of graphics, and covers the basics of getting started, your first year and beyond, pests, predators and diseases and good management. Good info on all the basics, and strong arguments for facts over suppositions and beliefs. A good epilog on not using chemicals, local bees, using standard equipment, and a caution to big chemical, big government and big ag about the role of beekeeping on the planet. It finishes with a good reference list and a strong glossary. This isn't the only book on beekeeping you need, but it's one of them.

Kim Flottum

Dr. Jamoke's Little book of Hitherto Uncompiled Facts and Curiosities Regarding Bees. Hezakiah Jamoke. Published by New London Librarium. ISBN 9781537414041. 5.5" x 8.5", soft cover, black and white. \$7.00. Available Amazon and other book outlets.

So, a hundred tidbits you didn't know about history, health, beekeeping, FAQs, installing packages, bee supplies and more in this tidy, attractive little book. For instance, the study of bees is melittology, honey bee should be two words, not honeybee, there are nocturnal bees that fly by moonlight, a pound of honey has about 1,382 calories, a pound of Honey Nut Cheerios has about 1,680 calories in about 4,160 actual cheerios, and in Poland, Michel Wiscionsky was chose king because bees landed on him during the election. And on and on and on. You'll drive your spouse crazy, your beekeeper friends nuts, and you'll win every trivia game you play. When I was in college we used to call these bits 'Fun Facts'. They are. And for \$7 it's a bargain.

A Practical Treatise On The Hive And Honey-Bee, By L.L. Langstroth. With an introduction by Rev. Robert Barid, D. D. Third Edition, Revised, and Illustrated with 77 engravings. Originally published 1860. Republished by Northern Bee Books. ISBN 9781908904522. 6½" x 9½", black and white, 409 pages. \$21.

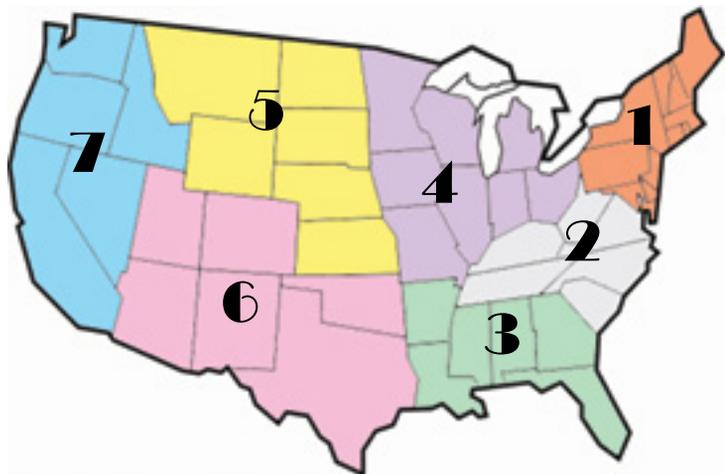
This influential guide by the Reverend L. L. Langstroth, 'the father of modern beekeeping' revolutionized the practice of beekeeping. Originally published in 1853, his work constitutes the first descriptive treatise of modern bee management – its innovations allowed people to engage in actual beekeeping, rather than simply handling bee domiciles and extracting the honey. This book explains and illustrates techniques still employed 150 years later – including the author's patented invention, a movable frame hive that quickly spread into common use around the world. This version of Langstroth's ever-popular manual is the fourth and final edition completed by him, and it incorporates the author's own revisions and remains an unsurpassed resource for beekeepers.

Advanced Top Bar Beekeeping. Christy Hemenway. ISBN 978-0-86571-809-8. New Society Publishers. Paperback, black and white, 160 pgs. 9" x 7". \$29.95.

The information in this book isn't so much advanced as it is taking the next step – your second season and beyond using a top bar hive. Christy looks at swarm control, honey harvesting, splitting and requeening and combining for overwintering and pretty much regular beekeeping, using tools you will recognize and be able to use right off. That's a good thing because too often top bar beekeepers are limited in what they do because they don't have the regular beekeeping experiences behind them when they start. This fixes that. She spends some time on ag chemicals and their effects in a beehive, looks at GMO products, and ends up exploring the use of oxalic acid for mite control. No wax contamination, bees alive next season, and all in all not a bad thing. If you are still having issues with a top bar hive this is a good resource, whether you don't deal with mites at all, or wish to be both a good neighbor beekeeper and a good host to your bees.



MARCH - REGIONAL HONEY PRICE REPORT



What do people sell, and where do they sell it. When it comes to honey, there's a predictable number of places you can sell your crop, and we've listed many, certainly not all of them here. And we've been doing this for eight years. Some trends have stabilized and can be counted on each year with little variation. It's when you see that bump in the road that you want to take a second look.

This year, contrary to what we would have expected farm market sales are sliding slowly off the display table for both the number of reporters selling there and the amount of their honey being sold there. Flea market sellers are up, but sales are down, and health food store sales continue their slide in both sellers and amount sold. Mom and Pop sales are back to where they belong in sellers and sales. Bigger chunks are being sold to big packers, who usually want it all, but interestingly sales at work are down in numbers both ways. What's the most interesting is the number of people selling at fairs, but how little they are selling.

If we were going to guess...the tendency toward putting energy into making bees rather than honey because of the lower honey prices is spreading into the smaller markets, too. Local honey gets a pretty good price, but maybe local bees are doing better.

Where Do They Sell Their Honey?

% of Reporters Selling at these locations								% of Their Honey Sales at these locations								Locations Honey Sold at
2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017			
71	77	77	72	83	61	67	51	36	73	31	39	46	38	Home (inside or roadside stand)		
17	16	19	14	24	14	20	26	19	34	43	32	42	34	Local community - sponsored farm market (i.e. Sat. & Sun. sales)		
19	29	28	26	22	24	20	31	40	31	29	20	44	30	Local Farm Market business that's seasonal (Fall only, for instance)		
26	29	26	25	28	27	19	34	33	35	26	30	37	38	Local Farm Market business that's year-round		
8	4	5	6	6	3	7	24	33	19	10	15	25	19	Flea Market		
35	39	35	83	22	22	35	18	24	20	22	19	27	22	Health Food/Organic store		
12	10	7	11	13	3	9	9	8	6	10	14	25	13	Gift Store		
13	16	17	13	11	2	14	20	21	17	12	19	80	22	Bakeries/Food Establishments		
17	14	5	10	9	10	16	13	28	5	16	34	38	18	Local High-End Retail Outlets (gourmet stores)		
30	31	27	32	35	15	33	22	16	27	25	20	37	24	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)		
14	17	4	7	11	7	14	32	35	13	28	45	44	43	Local Small Packer or Producer/Packer		
5	2	3	3	4	2	3	42	100	67	78	83	45	55	Huge Packer, they pick up		
13	11	9	8	11	9	7	38	41	51	37	45	45	48	Wholesale only to larger stores, you deliver to warehouse		
14	11	5	13	7	2	14	4	9	5	5	9	30	12	Breweries/Beer or Mead makers		
6	10	6	8	6	3	7	6	10	5	8	4	10	10	Internet, direct retail, mail order		
29	41	41	33	19	27	36	20	21	18	13	12	34	24	Work, direct retail		
8	6	16	10	7	2	16	8	6	16	13	7	27	5	Local/State Fair, with club		

*Total percentage of sales does not come out to 100% because of multiple outlets.

REPORTING REGIONS								SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	1.93	2.07	2.25	2.55	2.23	2.10	2.80	1.60-3.70	2.30	2.30	2.29	2.22
55 Gal. Drum, Ambr	1.83	2.02	1.90	2.57	2.39	2.04	2.80	1.50-3.65	2.21	2.21	2.17	2.14
60# Light (retail)	212.22	190.00	197.50	188.68	171.00	192.13	200.00	120.00-280.00	197.81	3.30	213.95	203.68
60# Amber (retail)	215.56	187.50	197.50	203.91	200.33	196.06	200.33	120.00-275.00	203.17	3.39	210.52	205.40
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	90.18	75.20	87.20	58.31	51.84	86.40	87.14	51.84-134.40	81.16	6.76	85.85	81.16
1# 24/case	131.65	106.80	127.51	111.09	127.16	111.38	124.50	45.00-211.20	120.90	5.04	124.50	115.81
2# 12/case	117.25	95.67	109.76	111.14	97.44	101.60	147.00	79.20-182.40	112.82	4.70	110.58	104.07
12.oz. Plas. 24/cs	110.04	82.00	89.87	85.66	74.40	103.80	107.40	66.00-172.80	95.40	5.30	100.75	96.23
5# 6/case	135.34	109.25	138.72	117.08	102.30	121.00	131.52	71.50-204.00	125.29	4.18	121.96	118.60
Quarts 12/case	192.11	122.63	129.00	134.16	155.32	137.94	181.45	110.00-325.00	145.41	4.04	151.91	140.00
Pints 12/case	113.83	79.83	75.25	71.69	111.00	81.48	100.50	60.00-168.00	89.61	4.98	98.20	90.37
RETAIL SHELF PRICES												
1/2#	5.26	4.36	4.81	3.66	3.59	3.00	4.73	1.98-7.75	4.59	9.17	4.79	4.42
12 oz. Plastic	6.24	4.74	6.00	5.43	5.17	6.28	7.95	3.25-10.00	5.97	7.96	5.77	5.48
1# Glass/Plastic	7.71	6.81	6.81	6.50	6.13	6.68	11.07	3.00-15.00	7.57	7.57	7.71	6.94
2# Glass/Plastic	13.55	10.52	11.89	11.54	10.83	10.50	12.57	6.00-20.00	12.13	6.07	12.73	11.73
Pint	12.59	8.72	8.66	9.41	8.30	9.62	9.66	4.00-16.00	9.33	6.22	10.66	10.73
Quart	20.03	15.43	15.78	15.96	15.52	16.10	21.22	8.00-38.00	17.29	5.76	17.92	16.00
5# Glass/Plastic	27.10	24.13	32.00	27.57	22.20	21.80	26.96	15.00-41.00	25.92	5.18	27.03	25.07
1# Cream	9.22	9.23	11.25	7.77	10.01	5.60	9.79	5.40-16.00	8.89	8.89	8.90	8.28
1# Cut Comb	12.27	8.06	8.33	10.79	10.33	6.50	13.25	6.00-22.00	10.71	10.71	11.27	10.70
Ross Round	8.88	7.00	8.95	10.75	8.95	9.50	9.20	5.00-12.49	9.15	12.19	8.59	7.77
Wholesale Wax (Lt)	7.86	5.13	5.33	5.06	6.00	5.55	6.62	1.90-12.00	6.30	-	6.22	5.84
Wholesale Wax (Dk)	7.42	4.75	4.50	4.89	5.71	3.17	5.71	1.85-10.00	5.49	-	5.85	5.47
Pollination Fee/Col.	96.33	59.00	57.50	79.00	80.00	90.00	114.00	30.00-200.00	86.14	-	87.63	86.43



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INNER COVER

We routinely conduct reader and customer surveys to keep tabs on what you are up

to, and what you think about what we do here. Most of them are short, more or less focused on a particular idea or practice, and we quickly make adjustments if needed or beneficial. Less often we conduct longer, more in-depth surveys to determine global shifts in our audience, in what they are doing, who and where they are and what they need to keep on keeping bees. We did one of these this

past Summer, and it was conducted strictly via email rather than our traditional send-out-paper-and-get-paper-back forms. Email is, certainly, a less expensive way to do this because of postage and data entry costs, and, if you use the right software you automatically have a data base set up you can ask questions of and do some pretty sophisticated analyses with.

Right off we know that this automatically excludes some portion of our readers and skews the results a bit in favor of those who have and use email. We have found from past surveys, however, that the number of readers we have that don't use email is, though larger than we'd like not so low as to not be able to use them. But we also know that, interestingly, the@ group and the not@ group share essentially the same ideas, the same requests and want the same things from this magazine. Moreover, when comparing the two populations they are, with only a couple of small exceptions, essentially identical. Email being the obvious one, and what-else-they-read-besides-beekeeping-magazines the other. I'll explain that later.

But wait, there's more. This was an all-inclusive survey that went to subscribers of CATCH THE BUZZ, the digital and app versions of the magazine and the paper subscribers. We were able to sort out duplicates so we were able to separate them into their respective groups when analyzing the returns. So we had an 'only' group for each, and were able to join them for combined analyses.

It's a secret how many people this comes to, but from past surveys we've done on paper, which, yes, isn't quite the same, we had a good feel for the percent return we would get, and chose a sample size large enough to make that return percent a statistically significant and more importantly useful number. To those of you who got one of these, and then returned it, thank you.

As a short aside, I'm a sucker when it comes to surveys. I'll fill out any survey that comes my way as best I can because I know the folks sending them are (almost always) trying to make my life – better, cheaper, faster, more productive, take-your-pick – and that can't be bad, right? Of course there are those that are simply gathering information for – advertisers, sales agents and the like – but they are pretty easy to spot. When it's obvious, I'll skew the data as far as I can and still make it reasonably believable. I've been a 93 year old, mother of six, richer than you can imagine farm wife all my life, high school educated citizen of Germany more times than you might guess . . .

Anyway. Some of this is comparing to surveys taken some time ago, other parts are new and haven't been asked before. So . . .

You are getting younger, you know. Today 86% of you are over 45, while 20 years ago 92% were over 45. Today, 53% of you have a college education, up from 43% back then, and 37% have been subscribing more than 6 years, while back then it was closer to 45%. Today, 72% have 10 or fewer colonies, meaning 28% have more than 10. That ratio hasn't changed hardly at all, all these years, and, in fact pretty closely mirrors the 75:25 ra-

tio other surveys have shown in more recent times. Urban beekeeping, not just large cities, but small towns and suburbs is increasing, too. It used to be a 90:10 country:urban split, today it's a 63:37 split, which is certainly encouraging.

Two thirds of our readers are male according to the survey, but that's not quite an accurate statement. What happens is, the magazine gets shared with other folks in the house, but it was a male that filled out the survey. We checked this the last time we did a readers survey, and what we found was that although it was an 82:18 split on the survey, when asked, the readers came out to about a 70:30 split. That moves us this time after that adjustment to just about a 50:50 split, which is refreshing.

Fifty-three percent of you spend \$500 or less a year on your beekeeping, which goes in line with the number of colonies you keep, but 47% spend more, and 10% spend more than \$5000 a year on the craft.

What are the most requested articles? Seasonal management, pest and disease control and identification, swarm management (see below for some of that) top the list, followed by honey production, regional management, marketing, IPM, equipment differences, basic biology, queen issues, and managing and making nucs and splits.

What else? You want even more on honey plants and growing honey plants, and info from national and state meetings, and what kinds of products can be made with bee stuff, and then, how do you sell what you make. And here's an opportunity for one of you creative types out there. Web page and YouTube evaluations and reviews. What a great idea! There's some good stuff out there,

Readers.

but there's some that's just plain scary bad, and when you're just starting out, how do you know the good from the bad?

More of our readers are part of a forum or regularly tune into University or Government web pages than read the American Bee Journal, but only 14% read a local association newsletter. That hasn't changed much – from what we can figure, fewer than 20% of all beekeepers belong to a local association. It's been that way for as long as I've been here.

And a final, very encouraging note. Almost 40% want to go from a present hobby to a sideline business in the next three years. That's a growth model I think is wonderful. Go Beekeepers!

•

That swarm on the cover came from a hive of mine two springs ago. It had a third season queen, was two supers bigger than anybody in the county, and wasn't as mean as snot, but almost. My goal, had I been anywhere near Ohio, was to split it four ways, maybe five, and eventually requeen the lot with stock that actually liked me, rather than what was there now. The day I found this, late afternoon, was the day I took off work early to come home and make the splits. Missed it by THAT much, dang it. I watched it leave – I don't do trees anymore – about 15 min-

utes after I first saw it. Took a look at what was left and decided I could still get three small splits out of it each with a couple of queen cells to boot.

OK, how many beekeeping biology errors did you pick up on in that story? Everything I did was wrong, right? First off, that colony should have been split the previous July, probably at least three ways, and maybe four, to provide a broodless period for long enough to get every mite exposed so a treatment would be possible, or at least the bees could groom like mad to clean up the mites. That broodless period lasts as long as it takes the splits to raise a cell, and just when it's ready I remove the cell and introduce the genetics I want. During this queenless time the split has almost no brood to feed so can concentrate on making the best of the Fall crop and store honey instead of feeding the kids.

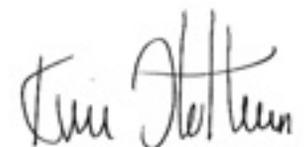
Then, these units have a brand new queen going into winter, and by the time foraging is over, they have a hive full of very young, healthy and nearly, if not completely mite-free bees.

So now it's March, and those bees out there are already planning on doing this very same thing because those colonies weren't split last July, so now what? Well, working with the bees is a bit different than working for the beekeeper isn't it? They start thinking that a natural swarm occurs when queen pher-

omone is dissipating, when there's a nectar flow on, when the weather is good, and when there's enough bees. They need all of these to set the scene, so your job is to make sure at least a couple of them are missing. Reduce the population *and the space* to give a smaller colony environment before early flows and good weather. Common sense says that they need room to expand, but you provide that room in a smaller space – empty comb in no more than two boxes, and one is better, along with a lot of bees moved out, you'll suddenly have a small colony that isn't in the expansion mood because there are fewer bees that aren't pushed for space and a queen with plenty of room. And you also have two, three maybe four small splits to go with it that you requeen if you can, or let them start and requeen before their queen emerges. Big splits from big colonies do well for honey later if you can keep them from swarming just a bit later, but keeping them small keeps them home – mostly.

•

Ya gotta love that picture. California has been dry for so long that this must be a mirage, right? Of course by now the biggest pollination event in the universe is over, or nearly so, and it's time to measure the season. Weather is a kicker this time of year. Rainy days stop flying and flying is how this gets done. Though it's amazing how few actual flying hours are needed to get a good set, so – we'll talk to some beekeepers and almond guys now that it's over and see. Meanwhile, anybody got some extra dry bottom boards?





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It's Summers Time –

Spring, Galveston, Time With Ann

In theory by the time you read this it will be almost officially Spring. I'm not sure what that means in you're part of the world, but here in Northeast Ohio it's all over the map. We had a 60° day this week (mid February) and sunshine and today it's 25° and snowing like crazy. It will be in the 50s over the weekend. It's confusing for everyone – humans, chickens and bees. When it's 60 the bees get to make those cleansing flights. Of course there's no food available out there. As of a week ago all of our hives were alive and flying, so we'll keep a good thought.

We were fortunate to spend a few days in Galveston, Texas in January, at the North American Beekeeping Conference – joint meeting of the Federation and the Honey Producers and other groups. It was great – right by the ocean, the hotel was just a few yards from the conference center, nice restaurants in the hotel and close by. And it was January in Texas, not Ohio. It's always nice to get away in the Winter.

The best part of the meeting is seeing old friends and we saw quite a few. I think I only went to two talks and spent most of the rest of the time just visiting and catching up. Jean, our advertising sales person was able to attend with us and she spent her time introducing herself to people she's only talked to via phone or email. Now they all know what she looks like. This was her first National meeting. And it was very successful. She made a lot of new contacts.

One of the highlights for me was getting to spend time with Ann Harman. We hadn't seen her for a few years. There's quite a chunk of beekeeping history all wrapped up in that lady. She was writing for *Bee Culture* before Kim started here over 30 years ago. So he has known her about 35 years – he first met her at an EAS Board meeting in the 80s. Although I don't remember our exact first meeting, I would have met Ann at my first EAS which

was in Lancaster, PA in 1994.

Ann has travelled all over the world – she has visited 29 countries and had 53 assignments as a volunteer. She's taught people all over the world how to keep bees.

When I get those rare chances to spend time with Ann we talk about cats, dogs, kids, chickens, bees and just life in general. She has stayed in our home and we've gotten to know her pretty well over the years. She is definitely one of my heroes and a dear friend. Ann Harman is a dynamo in the beekeeping world. If you haven't met her, I hope you get the chance one day.

There are a couple of things I want to make sure you are all aware of. It's the time of year when many clubs are having their Spring meetings and although it's almost too late now, we are always happy to send you copies of *Bee Culture* or our new publication, *BEEKeeping* for your beginning classes or meetings. You just need to let us know at least four weeks before the scheduled event by contacting Amanda@beeculture.com and she'll take care of you.

Also, have you heard about the Kim & Jim show. These are webinars that are done live each month, but they are archived on our web page – www.beeculture.com – so you can go there and view any of the past sessions. The next webinar is scheduled for noon on February 23 with Editor Kim and Jim Tew and others. You can sign up on our web page.

Don't forget about one of the biggest Spring meetings that we know of right here in NE Ohio – The Tri-County meeting in Wooster. It's March 4 and last I heard there was still room. But hurry!

We're still trying to work out the details for our annual Fall event. We wanted to have *Bee Culture's Best* in October, but we're having a hard time getting all or most of our authors on the same weekend. So we may have to change the date or come up with another idea. So watch next month's pages and we will have made a decision by then.

If you're passing through Medina in July *Bee Culture* will be having our annual Pollinator Day right here on the Root Candle property, on July 15. That's a Saturday and rain or shine we'll be out in our pollinator gardens with the Master Gardeners, the Soil & Water folks, OH State Extension people, Monarch Watch people and more. There's food, there's fun and you get to hang out with us!

There's always a lot going on in the beekeeping world. Sometimes it's hard to get to the actual beekeeping.

Here's one more. We're tossing around the idea of getting a group together to travel to the National Honey Show in October in London – that's right, England. Wouldn't that be fun. We'll keep you posted.

I hope you're having an easy Winter and that Spring will come quickly wherever you are. Take care.

Shelly Summers



Ann Harman and Kim at the airport in Houston.

ATTENTION!

In with our January issue you received a flyer from Stoney Acres Bee Supply, 780 St. Rt. 545, Ashland, Ohio 44805. Due to the heavy volume of orders they have received, they are no longer able to handle the shipping of orders. If you are able to pick up your order they will still be filling the orders. If you've sent them an order and have not received it yet please contact them at the address above.



FOUND IN TRANSLATION

Studying The Weather Goes A Long Way In Knowing Colony Health

Jay Evans

totenv.2016.11.178. The scientists involved include two climate experts as well as Karl Crailsheim and Robert Brodschneider, leading bee researchers from Graz.

Honey bee colonies, along with humans and the rest of life on Earth, are strongly impacted by the weather. As a species, *Apis mellifera* has succeeded incredibly well from the tropics to the colder regions of Europe and Asia. With help from their human keepers, honey bees now live across most of the globe, surviving drought conditions, intense rain, and winters that have them sheltering for three fourths of the year. Still, bees and beekeepers are not completely immune from climate impacts, both current and forecasted. Understanding the impacts of climate on forage and bee needs is vital for thoughtful beekeepers as they make decisions about bee movement, provisioning, and parasite control.

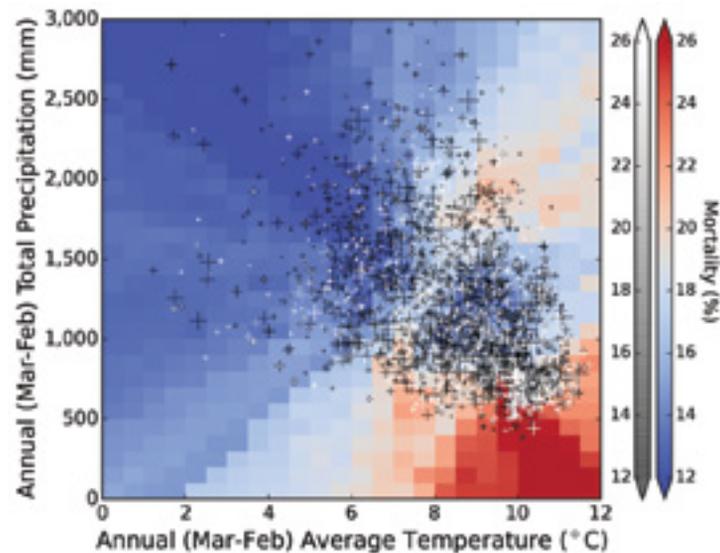
A recent study shows the value in exploiting high-resolution weather data in order to predict climate impacts on honey bee health and overwinter survival. Thanks to our economic and emotional obsession with the weather, satellites and ground weather stations collect continual data at a fine scale throughout the world. Matthew Switanek and colleagues from the University of Graz in Austria used creative methods to connect weather data to bee colony fates in their recent paper “Modelling seasonal effects of temperature and precipitation on honey bee winter mortality in a temperate climate”, freely available in the journal “Science of the Total Environment”, <http://dx.doi.org/10.1016/j.scie>

The authors used computational tools and weather station data to infer temperature, rainfall, precipitation, windspeed, and solar radiation on a five kilometer (km) x 5 km grid across the entire country, a scale that matches honey bee foraging distances. They merged six years of weather reports with colony overwintering loss rates for the same timespan and let the data tell them which weather variables aligned best with individual colony loss rates. Thanks to the mountainous nature of Austria they found great variation in all of these traits both across months and years and across apiaries in the country. They also benefitted from an open survey of beekeepers and precise colony locations for >100,000 colonies across the five

year study. The most important predictors for colony loss were temperature and precipitation; higher temperatures and low rainfall in almost every month were both tied to future colony losses. An exception that lends credence to their methods was February, for which extreme cold snaps reversed the temperature effect and had a negative relationship with colony survival. It is important to note that the computer models used by the authors separated each variable, even those that are naturally correlated (i.e., sunny, warmer days are tied to less rainfall). Again, this gives more confidence that they are identifying causal factors in colony survivorship.

In the end, they used their weather grid to ‘predict forward’ weather impacts on colony overwintering loss rates. Along with producing a spectacularly colorful graph (below), this effort did quite well in forecasting overwinter mortality for

Average annual (March-February) temperature and precipitation values for the beekeepers in the period 2009-2014. The plus signs are located according to the beekeeper's observed climatic values, while the gray colorbar shows their Winter mortality percentages. The blue to red colorbar reflects the modelled mortality sensitivity to climate. The colored grid cells are obtained with a simplified kNNM that is run using annual temperature and precipitation as predictors.



Austrian beehives. The results do not overwhelm the many additional factors that impact colony health, from parasites and pesticides to nutrition, but rather show how weather interacts with these factors. Indeed, good beekeepers, given colony checkups and their own climate sense, can and do adjust to weather all the time. Weather and seasonality are no-brainers for mite treatments, colony transport, and nutrition for example. Nevertheless, these results indicate that weather had a strong and often quite local background impact on winter losses on top of beekeeping decisions and variable external pressures.

On a practical level, beekeepers might be able to use this month's or last month's rain regime as a predictor of forage long before those plants start flowering. On a larger scale, honey producers and agricultural statisticians could use, and likely are using, weather patterns worldwide to infer colony health and productivity. For both efforts, the computational tools used by these authors might help decouple the weather from the many other factors beekeepers and producers juggle

when making their decisions.

If you are curious to see for yourself the precision of weather data and even apply it to your past notes regarding bee survival, treatment and feeding, there are excellent and freely available resources. As a start, plug your hometown or apiary zip code into the web at <https://www.wunderground.com/history/>. If you choose a random date from the past, you will see all the basic weather information you might care for. If you are a multi-generation beekeeper, or especially lucky, you can compare your colony notes to daily or monthly weather records from the 1930's onward for some sites in the United States. International locations listed in this site seem to be limited to the past 20 years, still a good time frame for those curious to see how the weather matches their own beekeeping successes and losses. Should you wish to carry out your own analyses of longterm weather effects on local honey bee colonies, you can enter extended dates. With little effort, I was able to get a spreadsheet file showing daily numbers for all the basic weather parameters in College

Park, Maryland, from 1948 to the present time, fun!

In a future column I will dig into research on the matching bee genes to their environment, a hot topic in beekeeping and bee breeding. As a teaser, I was privileged to watch a fascinating talk by Erin MacGregor-Forbes at the 2017 North American Beekeeping Conference. With support from the federally funded Sustainable Agriculture Research and Education program (www.SARE.org), she conducted a timely experiment to determine colony fates when honey bee packages headed by southerly queens were requeened with queens reared from populations closer to her Maine study site (http://mysare.sare.org/sare_project/fne12-756/). Indeed, this manipulation had a strong positive effect. Time will tell whether these striking results reflect climate-adapted genes, queen quality, or perhaps the benefits of requeening mid-season, but the potential is great. **BC**

Jay Evans is the Research Leader for the USDA Honey Bee Lab in Beltsville, MD.



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A Closer LOOK

POLLEN CONSUMPTION AND DIGESTION

Clarence Collison

Protein (pollen) consumption is necessary for the glands to develop fully and to produce high quality protein-rich jelly for the brood..

Pollen consumption by adult workers is necessary for proper post-emergence gland development and growth of internal structures during the first eight to 10 days of life but after that is not essential unless older workers begin to produce brood food and feed larvae (Winston 1987). Hypopharyngeal or brood-food glands are undeveloped when bees emerge from their cells, but within six to 12 days they are mature and active. Nurse bees have the most functional hypopharyngeal glands, as it is their principal duty to feed the brood. Protein (pollen) consumption is necessary for the glands to develop fully and to produce high quality protein-rich jelly for the brood.

To determine when bees begin to consume pollen, newly emerged bees were caged on small combs of pollen and sampled every two hours for 72 hours (Hagedorn and Moeller 1967). By the time they were 12 hours old, 50% of the bees had consumed a small amount of pollen. The rate of consumption remained at a fairly constant low level until the bees were 40 hours old, after which they began to consume larger amounts of pollen.

Dietz (1969) looked at pollen consumption under both laboratory and hive conditions and found significant differences in the early hours of emergence. Pollen was already present in 17% of incubator bees after one hour and in 25% after two hours. Pollen consumption was negligible in the first two hours under hive conditions. Continuous pollen consumption in roughly 85% of bees begins about six hours after emergence under laboratory conditions, and about 10 hours under hive conditions. The percentage of bees feeding on pollen in these two groups is almost identical at the end of the 12-hour test period. Pollen grains are already effectively removed from the honey stomach in very young bees by the filtering action of the proventriculus. Movement of pollen into the anterior intestines and recta of incubator and hive bees is negligible in the first 12 hours after emergence.

The pollen content of the gastrointestinal tract of honey bee workers was

“Although pollen is the major dietary source of protein, lipids and vitamins for adult worker honey bees, relatively little is known about the mechanisms(s) employed by adult worker bees to release the protoplasmic nutrients from the pollen’s relatively indigestible cellulose wall (exine)”

investigated in the morning before the beginning of flight activity. It was low in young bees, largest in about nine-day-old nurse bees and declined to minimal amounts in foragers. In all age groups, the amount of pollen in the honey stomach (crop) was small but that in the midgut was representative of the age-related status of the bee in the system of division of labor. It could be correlated with the developmental stage of the hypopharyngeal glands and to the known content of proteolytic enzymes (digestion of protein) in the midgut. The higher pollen content of the rectum followed the same pattern as that in the midgut. The predominant two pollen species (*Castanea sativa* MILL (Sweet Chestnut) and *Trifolium repens* L. (White Dutch Clover)) were digested more efficiently by young bees than by foragers. The species of pollen found in bees from all age groups was constant and similar to the species of comb-stored pollen. The known age structure of the colonies permits an estimation of the amount of pollen in the gastrointestinal tract of all workers in a normalized colony. It was 80.7 and 107.1 grams in the two hives investigated. The pollen requirement for a year could be calculated from the average pollen content of a bee and the estimated bee-days per colony. It was 13.4 and 17.8 kg (29.5 and 39.2 lbs., respectively) in the two hives (Crailsheim et al. 1992).

During the broodless period in Winter, the pollen content of the gastrointestinal tract, the

degree of pollen digestion and the proteolytic activity in the midgut were investigated in bees from the margin and from the center of clusters of two colonies in Austria. In addition, the movement of bees within the Winter cluster was examined. There was no difference in pollen content and proteolytic activity between bees from the center or margin of the cluster, nor did the two groups show a preference for staying at the center or on the margin of the Winter cluster. Compared to eight to nine-day-old-bees in Summer, the amount of pollen in the midguts was smaller by a factor of 100-1000, but the degree of pollen digestion in the midgut and the rectum was significantly greater; the proteolytic activity in the midgut was approximately a quarter. The more efficient utilization in spite of lower proteolytic activity might be due to pollen staying longer in the midgut. Foragers in Summer also consume only minimal amounts of pollen but have a smaller degree of utilization than Winter bees. The reduced pollen consumption rate, and efficient utilization in spite of lower proteolytic activity are useful adaptations to the reduced availability of pollen and reduced protein metabolism which bees experience during the Winter (Crailsheim et al. 1993).

Drones (*Apis mellifera carnica* (POLLM)) consume pollen during their first days of life; after they start to fly, pollen consumption is negligible (Szolderits and Crailsheim 1993). Intestinal proteolytic activity is low at emergence; the maximum is reached between the 3rd and 4th days, and is extremely low in flying drones. Pollen digestion is low in older drones. Proteolytic activity occurs only in the midgut, which changes its weight and color during adult life. Activity is greatest in the most posterior part. Compared to worker bees, pollen consumption, proteolytic activity and pollen digestion are lower in all age groups of drones that consume significant amounts of pollen. This is true although the drones have about twice the body mass of worker bees.

Hrassnigg and Crailsheim (1998) found that midgut dry weight (tissue plus contents) of worker bees was a representative parameter for pollen consumption. Midguts of bees of successive ages were analyzed and correlated with various parameters. The relative proportions of sugar,

protein and water were either constant or negatively correlated with midgut weight. Only the relative pollen weight (percent of midgut dry weight) increased. To investigate the influence of different levels of brood on pollen consumption of individual bees, midgut dry weights from two normally breeding control colonies and two brood-reduced experimental colonies were analyzed. In bees from control colonies the pollen consumption increased up to the nursing age (three to 10 days), remained on an elevated level in middle-aged bees (10-18 days) and decreased relatively sharply towards the foraging ages (> 21 days). When queens were caged in the experimental colonies, the following decline in brood cells affected the consumption of pollen differently. After six days of caging, with a reduction of open brood only, no effect was seen. After 15 days, and even more pronounced after 23 days when no brood was present, the pollen consumption in young and middle-aged (10, 14, 18 days) worker bees was significantly reduced, while it was clearly elevated in older bees, possibly to enhance life span.

Although pollen is the major dietary source of protein, lipids and vitamins for adult worker honey bees, relatively little is known about the mechanism(s) employed by adult worker bees to release the protoplasmic nutrients from the pollen's relatively indigestible cellulose wall (exine) (Klungness and Peng 1983). The outermost layer of the pollen wall is the pollenkitt, a semi-solid coating comprised primarily of neutral lipids, hydrocarbons, terpenoids and carotenoid pigments (Dobson 1988). Inside the pollenkitt is the exine, an often intricately-ridged matrix of the complex carbohydrate sporopollenin. The exine greatly resists decay and digestion, but is commonly perforated by one-to-several pores or slits (germination pores) that lead to the inner wall layer, known as the intine. The intine, composed primarily of cellulose and pectin, also resists decay and digestion, and forms the final barrier to the nutrient-rich cytoplasm. Thus, any animal consuming pollen contacts pollenkitt nutrients through external probing of pollen grains or ingestion of pollen grains, but must penetrate or dismantle two resistant pollen wall layers in order to access cytoplasmic nutrients (Roulston and Cane 2000).

Pollen pellets collected by forager bees show little sign of damage or predigestion, from the time of their collection from floral sources until their storage in the comb (Klungness and Peng 1983). Later, stored pollen (bee bread) is torn off in small pieces by the mandibles of the worker bee before being ingested. However, the gnawing and grinding action of the mandibles does not provide sufficient mechanical force to break the wall of the pollen grain (Whitcomb and Wilson 1929). After being ingested, pollen grains in the crop (honey stomach) are collected by the lips and hairs of the proventriculus where a bolus is formed before passage to the midgut (Bailey 1952; Barker and Lehner 1972). Once the bolus enters the midgut, it is ensheathed by the peritrophic membrane and subsequently takes one to three hours to progress through the entire midgut (Bailey 1952; Barker and Lehner 1972; Dietz 1969).

The digestion of dandelion (*Taraxacum officinale*) pollen by adult worker honey bees was initiated at the germination pores. Thirty minutes after feeding, pollen had reached the anterior midgut and the germination pores had become swollen. This permitted further removal of protoplasm during the next two hours of digestion as the pollen passed into the middle portion of the midgut. Three hours after feeding, pollen grains had reached the posterior midgut where some had ruptured to release both 'naked' protoplasm and masses of protoplasm but many remained intact or were only partially digested; undigested pollen



grains passed unchanged to the rectum. The lipid-rich pollenkitt layer was removed from the exine during digestion. This study indicated that dandelion pollen was not utilized completely by honey bees (Peng et al. 1985).

Histochemical staining of embedded sections of the alimentary canal of honey bees indicated that carboxylated polysaccharides could be efficiently digested and absorbed, except when sequestered within unswollen and unbroken pollen grains that appeared to be impervious to enzymes of the gut. Hemicelluloses and pectic acids of the pollen wall structure underwent partial digestion, but pollen wall cellulose and sporopollenin were not digested. A separation of pollen walls from colloidal semisolids of the pollenkitt and disgorged protoplasm was apparent. The layers of slurry created by this separation remained in the rectum, and consisted primarily of saturated organic compounds which do not stain with weakly basophilic or acidophilic dyes (Klungness and Peng 1984).

Proteolytic activity in the midguts of pupae and imagos (the adult stage) of worker honey bees was determined over a one-year period. The bees were of defined ages and the size of the hypopharyngeal glands was used as a parameter of their functional status. The activities of trypsin-like, chymotrypsin-like enzymes and the total caseinolytic activity were investigated; they did not depend on Ca^{2+} and showed optimal turnover at pH values above seven. Proteolytic activity is limited in pupae and newly emerged bees, then increases rapidly in the first hours of the imago stage. Proteolytic activity and the relation between trypsin- and chymotrypsin-like activity vary with age, season, and functional status. Nurse bees show the greatest proteolytic activity. Age-dependent distributions of enzymatic activities in the endo- and ecto-peritrophic space indicate the peritrophic membrane establishes compartments for digestion within the midgut lumen (Moritz and Crailsheim 1987).

Honey bees satisfy their lipid requirement by consuming pollen. The free fatty acid content of the midgut was used to quantify fat digestion. Midguts extracted from younger workers of known ages and

from foragers were divided into three components: endoperitrophic region (peritrophic membrane with gut contents), extraperitrophic region and intestinal wall. Both the total amount of pollen and the amount of free fatty acids in the endoperitrophic region and in the intestinal wall depend on the bee's age. The amounts increase within the first three days of a honey bee's life, reach maxima around the age of eight days and then decrease continuously to the lowest values, measured in forager bees. Forced feeding with triacylglycerol results in significantly higher levels of free fatty acids, especially in the endoperitrophic region, in eight-day-old bees and foragers. This indicates that lipolytic activity depends on age and that the free fatty acid content in eight-day-old bees is primarily limited by the amount and availability of lipids ingested. The results show further that fat digestion depends on the functional status of honey bees, as is the case for pollen consumption, speed of transport of pollen bolus through the alimentary canal and protein digestion (Loidl and Crailsheim 2001). **BC**

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Denise Ohio and Catherine Minden

We live in the foothills of the Cascades in western Washington, northeast of Seattle. While we're not technically in the *middle* of nowhere, you can see the middle of nowhere from the end of our driveway.

The land is full of trees, flowering plants, and understanding neighbors – a great place for honey bees. We've kept hives for over 20 years, taking a break to build our straw-bale house and returning to beekeeping shortly after beekeepers began seeing devastating losses. Several years ago we started growing lavender, distilling the plants for essential oils and hydrosols we sell at local markets and gift shops. But our focus always, then and now, has been on the honey bees.

We saw what happened when *Varroa destructor* moved in, the initial attempts to understand and fight it, and the joy soon followed by crashing disappointment as first one, then another, then another treatment failed. It was apparent early on that there was never going to be a single way to help the bees fight the parasite and diseases the parasite brings with it. It's going to take a slew of tactics, even after the bees bred for hygienic behavior predominate, to manage these challenges.

Still, as difficult as it can be, it doesn't take long in the company of honey bees to realize how remarkable they are. And as devastating as *Varroa* has been, it doesn't take much to realize how remarkable *they* are. But while I find *Varroa* astonishing, that doesn't make me like them any better.

We usually treat for *Varroa* in early Fall but monitor throughout the season. Rarely have we needed to treat during the height of summer. (It's happened, but it's not typical). And while we use Mite Away Quick Strips® (MAQS) and Api Life Var®, like most beekeepers, we're always looking for treatments that are easier on the bees (and us) that the mites won't be able to develop resistance to.

So I had a lovely thought one afternoon in late winter: control *Varroa* by finding an insect that won't harm the bees, views *Varroa* as a meal, and can thrive within the environment of the hive.

They work . . . but will they work for bees?

I heard about one particular beneficial insect during a Focus on Farming conference sponsored by Snohomish County in 2015 when I cornered a presenter named Alison Kutz from Sound Horticulture (<http://soundhorticulture.com/>) in the lunch line. Alison supplies beneficial insects to nurseries and greenhouses, and I asked if she knew of any beneficial insects that could be used against *Varroa* in a beehive.

Her immediate response: "Strats."

Stratiolaelaps scimitus 'Womersley' (once called *Hypoaspis miles*) is a beneficial insect that preys on soil-dwelling pests such as fungus gnats and pupating western flower thrips. These ground-dwellers are fierce

predators. They're indigenous to many parts of the world, plentiful, easily raised in a production environment so getting them isn't difficult, and, in addition to being used in greenhouses, are used to control pet and spider mites.

Strats will eat *Varroa* (see it in action at <https://www.youtube.com/watch?v=rcVbtpIV9oQ> or <http://www.niagarabeeway.com/Varroa-mite.html>) and aren't interested in honey bees as food at any stage of the bees' life cycle. However, it appears they only go after phoretic mites so we can't count on them to go into brood cells. And even if Strats are eager *Varroa* predators, there are three things about them that could make them totally impractical as an effective *Varroa* treatment.

First, Strats live in the top half-inch of the soil, so it may require multiple applications over the season or another piece of equipment or application method to keep them in the hive. Second, they're expensive. More about that in a minute. Third, and most important, we knew there had been some studies regarding Strats and honey bees. One in particular had been pretty unambiguous that Strats were not effective against *Varroa* (Sagili 2014). Another study suggested that predators like Strats were probably not going to be as effective as fungi or bacteria but didn't completely rule them out as a possible ally in the fight (Chandler et al. 2010).

We decided to try for ourselves.

The adventure begins

2016 was an expansion year for our apiary. We wanted to boost the number of hives beyond our own splits, so we purchased 15 packages. We have had mixed results from various package providers. One year, a local provider of "hygienic" stock sold us packages of bees so infested with *Varroa* that we could see them on the adult bees. The parasites looked like disgusting little fanny packs, which is redundant. We got those hives healthy but were then hit with a drought and dearth. That was a fun year.



Photo by Denise Ohio.

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This year we bought from another recommended provider of “hygienic” bees. This time, several of the queens were poor performers from the get-go, but they were still better than the two who were just plain dead.

We replaced these queens with VSH stock and noticed that the offspring of these queens seemed more hygienic, though there didn’t seem to be a difference with temperament or productivity compared with those of previous queens, excluding the dead ones, who were neither terribly productive nor hygienic, though they were very calm.

All the package hives were installed in western supers (we use westerns for brood boxes and honey supers) and fed 1:1 syrup with Fumigilin. We continued giving 1:1 syrup with Pro Health until the honey flow began.

We selected 10 of the new package hives for our Strat test.

Five hives, C3, C4, C5, C6, and C8, were our controls. They received no treatment until the end of the season. Hives C11, C12, C13, C14, and C15 received regular applications of 200ml of Strats in media, purchased from local suppliers every four to six weeks through the season.

We bought 1-liter containers containing about 25,000 Strats in media. The cost per liter with shipping and handling was about \$42.00, and 1 liter was divided among five hives. We applied Strats five times throughout the season from 14 May through 9 September 2016. The total cost for the Strat application was \$210.00, or \$42.00 per hive. (In comparison, a MAQS treatment costs about \$4.40 per hive.)

Hives were monitored for *Varroa* using sticky boards and alcohol wash (Oliver 2013). Over the course of the test period, all the hives – both the test and control –were

fed and inspected on the same schedule. All had their bottom board inserts removed, and then replaced, at the same time. All hives were worked using untreated, dried lavender stems in the smoker.

Our friend Dirt

We knew that some people who were trying Strats in their hives poured the media onto a piece of paper resting on the tops of the frames. We didn’t do that. We wanted the bees and Strats to interact directly as soon as possible. So after a routine inspection, we would pour premeasured Strat medium directly onto the frames of the top super of the brood nest. We scientifically named this procedure “dirting,” as in, “Did you dirt that one?” What it lacks in poetry it makes up for in accuracy.

The bees started clearing the media off the tops of the frames as soon as we started shaking it out. In one of the hives, we watched a bee drag her front leg the length of a frame, sweeping off a streak of dirt onto the bees below. The bees cleaned up our experiment quickly. The media was usually gone by the next visit.

By mid-August, C4 and C8 of the control hives and C14 and C15 of the Strat hives were not flourishing and we removed them from the test. (They were later combined with other hives or turned into nucs.)

Within a week or so of each Strat application, *Varroa* parts started showing up on sticky boards. Sorry, no pictures of either the *Varroa* bits or us jumping up and down in glee.

But good news in Summer meant nothing in Fall.

And then we got sad

In September, we applied MAQS on all the hives in our C yard, including our control hives C3, C5, and C6 and our hives getting Strats, C11, C12, and C13. And we waited to see what we’d find on the sticky boards.

It was disheartening to see so many *Varroa*, with some sticky boards having more than 500 mites.

We were not the only beekeepers to see an alarming population explosion splattering the sticky boards after treatment. The president of our local bee club reported the same thing – hundreds of mites during mite fall days after treatment. Ultimately, for us, the mite fall for the control hives and the Strat hives was essentially the same.



Dirting the tops of frames. (photo by Denise Ohio)



The bees started clearing off the media as we were pouring it on. (photo by Denise Ohio)

Hive	C3	C5	C6	C11	C12	C13
Final	1	12	29	21	29	14
24-hour mite drop count						
Colony size	Medium	Strong	Strong	Super (Strong hive + 25-35%)	Super (Strong hive + 25-35%)	Medium

A twist

Here's the thing, though.

Strat hives C11 and C12 ended the season as the largest colonies in our apiary, by far. These hives were so big that we would rock-paper-scissors to see which one of us had to go through them.

There could be many reasons for this – the queens were particularly good, the location of the hives was just different enough, these hives benefited from drift, and so on.

We can't say C11 and C12 had lower mite counts because of the Strats. Our sample size is small. We started with packages and packages are weird. Or perhaps what we were seeing was similar to using powdered sugar to dust bees.

Powdered sugar dusting appears to be weakly effective against *Varroa*. While at first enthusiastic about powdered sugar dusting, Randy Oliver reported in January 2015 less-than-spectacular results and also noted Dr. Amanda Ellis's 2009 study, which showed only a slight reduction in mite levels with sugar dusting. A Honey Bee Health Coalition report (2016) states that sugar dusting was less than 10 percent effective.

The idea behind powdered sugar dusting is twofold. First, fine dust impedes a *Varroa* mite's ability to hold on to the host bee, so it falls to its death (Ramirez and Malavasi 1991). Second, when bees get dusty, they start to groom, knocking off the *Varroa* (Macedo et al. 2002). And while powdered sugar may not be as effective as we'd all like it to be, perhaps dusting with a safe but irritating material (such as peat moss or lime like in the Strat media), combined with the Strats, might be.

At the time, it didn't occur to us that maybe we should have applied media without Strats to some hives as part

of our test. I can imagine an insect smaller than a *Varroa* mite tickling the hairs on a bee's body as it makes its way through a hive, spurring the bees to groom more and knock off *Varroa* in the process. But that's just a WAG (a spectacular term that means "wild-assed guess"), which is worth exactly what you pay for it.

There's always next year

This experience gave some credence to our suspicions: as useful as Strats are, they're not going to do much for honey bees. But neither of us is completely convinced. So here's the plan: come Spring, we'll again assess these hives' strength, do an early mite count, and treat with Api Life Var if necessary. Then perhaps in May we will again start testing the Strats. This time, though, our control group will get only the media – basically, all dirt and no Strats. We'll continue monitoring using sticky boards and alcohol wash throughout the season.

It could all end in tears and recriminations or with rainbows and unicorns. Whatever happens, it will be even more interesting than beekeeping already is. **BC**

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The Layens Hive

Using Local bees, And An appropriate Hive. Unconventional? Perhaps.

Leo Sharashkin

“Keeping bees requires little effort, and barely any capital to get started,” wrote Georges de Layens in *Keeping Bees in Horizontal Hives: A Complete Guide to Apiculture*. Europe’s leading beekeeping authority, he certainly knew what he was talking about. Following his methods with my 40 hives, I witnessed that keeping bees can indeed be simpler than growing tomatoes, but most beekeepers’ experiences are quite different.

“My mother spent \$5,000 on her seven hives in the first few years!” Alan told me, his voice trembling with emotion. A typical scenario: you attend a beginner beekeeper’s class, buy equipment and protective gear, order bee packages, install them in the hives, treat against parasites and disease, feed in the Fall and then . . . they do not survive the first Winter. You buy more bees the following Spring and the cycle repeats itself. Faced with high bee mortality, mounting costs, and modest returns even many expert beekeepers hang it up.

What gives? Historical records show that a hundred years ago farmers commonly had multiple hives in their backyards. Bees required hardly any care and yet produced a honey crop five seasons out of six. Eva Crane documented that in many beekeeping systems harvesting honey was the only task a keeper had to perform. Why does it sound like science fiction today, and many experts recommend looking into your hives every two weeks?

Georges de Layens emphasized that sustainable beekeeping rests on two principles: *using local bees* and keeping them in *appropriate hives* that are gentle on the bees and the keeper alike, and require minimal management. De Layens spent two decades developing and perfecting a hive – now bearing his name – and a system that allows you to manage your colonies reliably with two or three hive visits per year.

The Layens hive and beekeeping method became one of the most popular in Europe. There are some 2.6 million hives in all of the U.S. Just one European country, Spain, smaller than Texas, uses over one million Layens hives today.

The Layens hive is a horizontal hive holding 20 large frames (13” long by 16” deep) on one level. (The number of frames can be smaller or greater depending on your local honeyflows.) It is loaded with frames during the spring inspection and then opened in the fall for honey harvest. If you think this is not feasible, consider this: Jean Hurpin, a prominent French beekeeper and author, founder of France’s largest beekeeping magazine *L’Abeille de France*, modified the Layens hive to enable management with *one* hive visit per year. He writes: “Layens hives are wonderfully suited for remote outyards. In the yards that I visit only once per year, I always find the bees in excellent shape with the hives full of honey, harvesting which becomes my sole task.”



This treatment-free apiary near Bozeman, MT, has Layens hives spread to minimize bee drift for better bee health. “After switching over to Layens hives, I was able to overwinter my bees successfully for the first time in my six years of beekeeping.” – Jeff R., MT.



Stationary Layens hives Winter great – thick warm walls provide ample insulation, big frames make honey continuously accessible to the wintering cluster, and a narrower nest minimizes heat loss.

After keeping bees in Layens hives for several years and having read his brilliant book, I felt compelled to make it available in the English language. Now that it has been released, I am very happy to share one of the chapters with you.

I certainly do not expect everyone, like myself, to switch over to the Layens hive system, but I do feel that every beekeeper can greatly benefit from this knowledge as it expands our understanding of what is possible in beekeeping, and the range of choices we all have.

“We cannot improve beekeeping by going farther and farther away from the bees’ natural tendencies,” wrote de Layens. “Instead, pick the hive model that is best suited to your locale, populate it with local bees, and the results will speak for themselves.” I fully agree.

Managing horizontal hives

A chapter from Georges de Layens’ book *Keeping Bees in Horizontal Hives: A Complete Guide to Apiculture* (500 p., 250 ill., Deep Snow Press, 2017).

Long experience has taught me that one should never stray from the following three principles, which constitute the bedrock of any good beekeeping:

1. Big hives.
2. Big frames.
3. Enough room in the hive to always allow the queen’s egg-laying to proceed uninterrupted.

In this way, you will: 1) minimize natural swarming; 2) produce as much honey as the location will allow; 3) build up a strong population by fall. All three points are very important for an apiary’s future.

My neighbor farmers have long applied this simple method to their apiaries, which consist of horizontal hives. These procedures have been used in my apiary for twenty years now, and for fifteen years in theirs, and this simple approach is becoming increasingly popular throughout France.

The apiary

My hives are in the woods, about two miles from my home. They’re arranged in two rows, down a path shaded by large trees. The hives are placed in pairs atop stands,



Laynes hives mimic bees’ natural habitat in trees – honey on top, empty cells for the wintering cluster below. When you pull honey in the Fall (late October in southern Missouri, Zone 6), honey frames away from the brood nest are fully capped and almost free of bees.

16” off the ground. This allows me to handle them much more conveniently, without stooping – and, when they’re kept higher off the ground, they’re less susceptible to excess humidity during the Winter.

The apiary is surrounded by wooden pickets connected by four strands of barbed wire – the most economical form of fencing. There’s a stream near the apiary that always has water in it, and the bees need only fly a hundred yards or so to reach the meadow.

Based on my own observations, in comparing various apiaries, I’ve concluded that the bees in an apiary shaded in a forest tend to swarm less often than one kept in full sunlight.

It is important not to arrange the hives in a straight line, but rather as irregularly as possible. This arrangement keeps the bees from returning to the wrong hive after foraging, and allows the queens to find their own hive more easily when they return from their mating flight, thus leading to fewer orphaned hives.

The equipment

My equipment is extremely simple, and can all be transported in a wagon.

1. A wheelbarrow with a frame box placed on top, large enough to hold twenty frames or so. This wheelbarrow and frame box are used to hold any frames I’ve just removed from a hive, or am planning to put there.
2. Two frame boxes large enough to hold 50 frames each, for moving full or empty frames from the apiary to the house or vice versa.
3. A good smoker.
4. A bucket with a tight-closing lid, and a long kitchen knife for trimming and removing bits of comb when repairing irregularly built comb.
5. A chisel for easily detaching frames. To use it, simply slide it in between two frames, then use it as a lever to detach any frame, even one stuck fast with a lot of propolis.
6. A small broom made of several goose feathers, for sweeping bees off comb.

Notes on inspecting hives

You should get used to visiting your hives without regard to what mood the bees are in, since waiting for an ideal day each time you need to inspect would waste too much precious time. The bees may be quite easy to work with one day, and more difficult the next. In any case, with a bit of experience and a lot of smoke, you can always get the job done. I’ve managed to harvest honey in October with neither me nor my assistant being stung a single time.

When opening a hive, the most important thing is not to remove a single frame until you’ve smoked heavily for a bit, from the top, in between the combs. Then, you can move quickly.

When I’m driving the bees off the frames, I never brush them outside the hive, onto the bottom board, but always back into the hive. In this case, they fall to the bottom of the hive; a few will fly away, but they’ll soon return to rejoin the other bees.

While I’m working, I always use an assistant, who smokes the bees while I’m busy; I’ve found that two people working in this way can easily do the work of three or four people working separately.

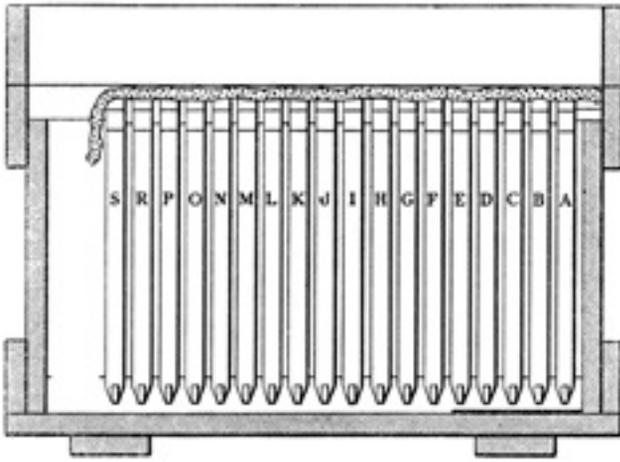


Figure 1. Laynes hive after the harvest in the Fall.

When Winter ends, novice beekeepers are often in too much of a hurry to inspect their colonies. This is a mistake – you should never disturb your bees while they’re at rest. Instead, wait until they’ve been actively working for a week or so. If you inspect your hives too soon after a long, harsh winter, some colonies may be found to have no brood, and a novice beekeeper may assume that they’ve become queenless, when in fact the queen simply hasn’t begun laying eggs yet. However, if you haven’t left enough honey for wintering (40–44 lb), some colonies may be running low on provisions, and you’ll have to feed them.

Here’s the easiest way to feed a colony in spring. Using a saw, cut several slices from a sugar loaf. Uncover some frames and, after soaking a sugar slice slightly in water, place it on top of the frames, then cover it with some thick fabric to prevent heat loss.

There’s another very simple way to feed bees: dissolve 17 lb of sugar, while heating, in 1 gal of water. Once the resulting syrup has cooled down, use a thin-spouted burette to pour it, from a certain height, into the cells of some well-built comb, in a frame laid flat on a table. Then, cover the frame with a sheet of paper, turn it over, and fill the other side as well.

It’s not a bad thing if a bit of old honey remains in the hives when main honeyflow begins; when this old honey is put through the extractor along with the new, it will contribute greatly to good, quick crystallization.

General inspection of the hives

Before going further, I should mention that my horizontal hives have two entrances, one on each end, and the brood nest is always at one end of the hive, instead of in the middle – either to the left or right, facing one of the two entrances, *with the other entrance always kept shut*. Since I believe that division boards are of no use, I haven’t used them in my hives for a long time now. But I have saved a few of them to use when transferring a colony or installing a swarm in a hive, in order to force the bees to build exclusively within the space I’ve given them.

I position my wheelbarrow, carrying the box full of frames, behind each hive, and arrange all of them as follows.

Let’s take, for example, a colony that wintered on 18 frames (fig. 1). I begin my inspection with frame A, the one closest to the hive wall, near the entrance. I remove it, then continue down the row until I come across the first frame with brood – in this case, frame D. So at this point,

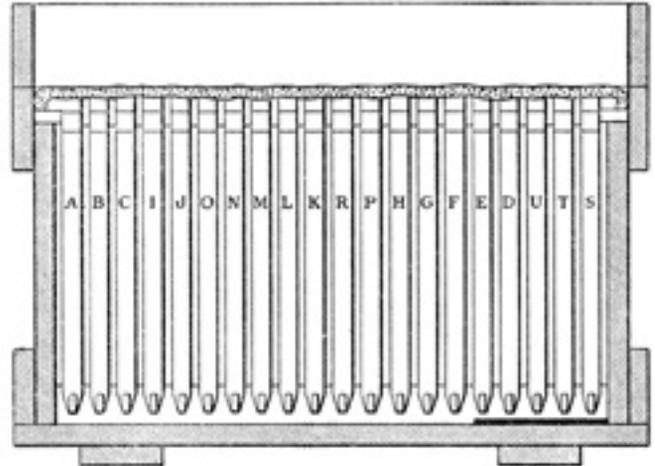


Figure 2. Laynes hive loaded with frames after the Spring inspection. See text for details.

I’ve removed the first three frames (A, B, C), which contain various amounts of honey, and placed them, along with their bees, at the other end of the hive (fig. 2); these three frames will be replaced by three dry-comb frames with worker cells (U, T, S – to the right in fig. 2), which I’ll take from the hive itself or from my box of reserve frames. If you don’t have any extra frames available, you can use frames with foundation instead.

But before putting the empty frames U, T, and S in place, I check the condition of the brood in frames D, E, F, G, and H (fig. 1). I leave these frames where they are, then remove, for example, frames I and J, which contain no brood but a lot of honey, and move them up against frames A, B, and C (fig. 2), and, in their place, I insert two worker cell frames, P and R (fig. 2). The remaining frames – K, L, M, N, and O – are left where they are, and I add more new frames until the hive is entirely filled.

So when the procedure is complete, the hive looks like this (fig. 2):

Three empty frames of drawn comb	S, T, U
Five frames of brood and honey	D, E, F, G, H
Two drawn comb frames, empty or with some honey	P, R
Five empty frames of drawn comb	K, L, M, N, O
Five frames containing various amounts of honey	J, I, C, B, A

Of course, all of these instructions aren’t absolute in terms of the number and condition of the frames that are moved – this all depends on the size of the colony and the amount of honey found in the hive. However, the general order the frames should be put in is always the same, and can be summed up as follows.

In Spring, the brood frames should be surrounded by frames of drawn comb that are either empty or containing only little honey (or none at all), so that the queen will not run out of room for laying eggs, right up until the period of the main honeyflow. Meanwhile, the frames containing a lot of honey should be moved to the far end of the hive – the end furthest from the brood.¹

¹You should use the spring inspection as an opportunity to add some frames to the hives – frames primed simply with some old pieces of comb glued firmly to the top of the frames. These frames should be placed at the far end of the hive opposite the one where the brood is found, and should be interspersed with frames already built out with comb. Add two or three such frames to each hive. This will ensure that the bees build the comb regularly within the frames. ↗

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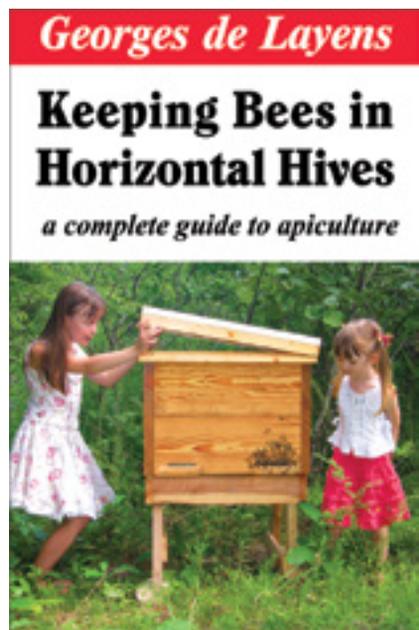
Layens hive advantages – no heavy lifting, all frames the same size, large combs for strong Spring buildup and good overwintering.

I arrange all of my frames in this manner each Spring, giving the queen plenty of room to lay. Most of the old honey, if any remains in the hive by the time the main honeyflow arrives, will be put through the extractor along with the new honey.

Between the first inspection and the honey harvest, all that's necessary is an occasional stroll through the apiary to make sure the bees are working normally.

Robbing is no threat to remote outyards, as long as you're keeping local bee races. The only case when you'll need to keep an eye on your colonies is when you're forced to feed them – and this should never happen, assuming you leave them enough honey in the Fall.

If, during one of these external inspections, you find a colony whose bees are exiting the hive with pollen on their legs, and bustling around the bottom board as if worried – and, at the same time, the bees seem to be working sluggishly or irregularly – then you can be almost certain that the colony has become queenless, or has a drone-laying queen. If this is the case, give the colony a frame with brood of all ages, or a queen, or a swarm.



A natural beekeeping classic, de Layens' book is full of advice applicable to any hive system.

In the Spring, it's very important to check the brood's condition carefully. If the brood is in tightly arranged patches, then the colony is in good shape: its queen is probably fertile, and its future is bright. This holds true regardless of how strong or weak the colony seems, or how much brood it contains.

If, however, you find that the brood is scattered, then the queen can't be doing well. In most cases, the hive will replace its queen and eventually be in good shape for wintering and for the following season.

You may also discover that a colony is orphaned, or has a drone-laying queen. If this is the case – and it does happen from time to time (if not every year, in a large apiary) – then you can eliminate the now worthless colony using the simple method described below. But save this procedure for a nice day when the bees are highly active, which clearly indicates that there is nectar in the flowers.

Move the hive to the edge of the apiary, remove all of the frames, and brush the bees off onto a bottom board placed on the ground, in the sunlight. The bees will fly away, and, unable to find their old hive, will seek out the hospitality of the colonies surrounding their former home. The honey this orphaned hive contains can go toward the purchase of a replacement colony.

If you're not able to carry out this procedure on the same day, you should greatly narrow the hive's entrance for the time being to avoid robbing.

The best way to replace queenless hives is to set aside funds from honey sales for buying replacement colonies, since, by buying your colonies from other keepers, you'll be constantly introducing fresh blood into your apiary. However, if you have multiple outyards at some distance from one another, you can also keep a small apiary of colonies in fixed-comb hives near your home, or moveable-frame hives with only a small number of frames inside – this apiary will be used to produce natural swarms for you to collect. This breeding apiary will allow you to fill in the gaps in your outyards as they arise.

The honey harvest

To obtain honey that is of high quality and has a long shelf life, you should only extract it from the combs when they are almost entirely capped. This means that I harvest late in the year, in September. Of course, this means that my sainfoin honey is mixed with honey from Fall flowers – but since, in order to find buyers easily, I have to sell my honey at roughly the same price set by local honey suppliers, and since the honey I produce using an extractor is infinitely superior to theirs, this blend of honey from various flowers presents no real problem. In any case, it's convenient to harvest in the Fall, since by this time of year there are fewer bees in the colonies, which makes the entire process go more quickly.

When harvest time comes, I make my way to the apiary with all of the necessary equipment, just as in Spring. I harvest at around four or five in the afternoon, and finish up around dusk. My method allows me to harvest a dozen or so hives in two hours.

I open each hive and remove the frames one by one, starting with the one that is furthest from the brood nest. If this first frame contains a lot of honey, it's a sure sign that there's a lot of honey in the hive. I usually remove between eight and 10 frames from a hive that contains 20 frames and is heavy. Note, however, that even if the

colony possesses less honey, I'll still need to remove the same number of frames – the only difference is that only a third or a quarter of these frames' surface will be taken up by honey, instead of the entire surface. Once you have a bit of experience, I recommend lifting the hives from the back and, by comparing their weight, deciding whether to remove a frame or two more or less. In any event, I leave at least 38 lb of honey for wintering. Depending on where you are your bees may need more.

Once the surplus frames have been removed, I typically cover gaps between the remaining frames with metal strips folded into a V shape (or with small wooden slats), then cover the empty portion of the hive with more slats, being careful to leave a 3/16" gap between them to allow the vapors emitted by the bees during the winter to escape. Finally, I spread a wool blanket or some straw on top of the frames and slats.

Wintering

As you probably noticed, I prepare my hives for wintering simultaneously with the harvesting procedure, which allows me to avoid returning to the apiary until the following Spring.

On the day when I finish these procedures, I place a mouse guard in front of each hive entrance located on the same side as the frames; the other entrance is always kept shut. As for the frames I've run through the extractor, I don't leave them in this same apiary for the bees to clean; instead, I place them in another apiary near the home of a sharecropper on my property.

But if you don't have enough space to store the frames during the winter, you can put most of them back into the hives. For example, you can leave 18 of them in a 20-frame hive, covering the last frame with wool blanket or straw as shown in fig. 2; the extra space allows any humidity – so harmful to bees – to escape through the roof during the Winter.

Sometimes I'm forced to harvest my honey earlier in the year, at a time when the honey has been only partially capped. In this case, I pass the frames through the extractor without uncapping them, to extract the uncapped honey only, which I use to make mead. Then I uncap the capped cells and extract the honey from them as usual.

I've tried just about every kind of knife for uncapping cells, but the one that has the most advantages is one that looks a lot like a drawknife used in woodworking: a curved blade, 3/8" shorter than the length of frames, with a handle on each end, allowing it to uncap easily, and not too tiringly, since it can be held with two hands. The knife should be heated before use.

Two hive visits per year

All in all, managing an apiary throughout the entire beekeeping season can be reduced to the following two main procedures: 1) the Spring inspection, when the hives are filled out with frames; and 2) the Fall harvest and preparing the colonies for wintering.

In these few pages, I hope I've shown how you can achieve, as simply as possible, a profitable average return over a number of years which, individually, may be more or less favorable – and how you can manage multiple apiaries in little time and with low risk.

The advice I've given here is not meant for those

who are just beginning to keep bees – but an intelligent beginner won't take long to learn how to handle hives and the bees in them. And it's beginners like these – novices who have grown into true beekeepers – that I've had in mind while writing this chapter.

How many farmers, priests, teachers, and even business owners would like nothing more than to manage bees on a fairly large scale, but are prevented from doing so by their many other responsibilities! Many of them may even have a few colonies near their homes, but balk at the idea of establishing larger apiaries when they consider all of the complex procedures that would constantly occupy them throughout the bee season – not to mention the daily monitoring that beekeeping manuals assure them is indispensable.

If you want to have a productive apiary, without it pulling you away from your other pursuits, then the advice I've given will allow you to increase your revenue prudently, steadily, and almost risk-free, and allow this country to reap the harvest of honey from its abundant nectar plants – a precious resource that would otherwise go to waste. **BC**

Get the Layens book and save \$20

You can get a copy of Georges de Layens' book *Keeping Bees in Horizontal Hives: A Complete Guide to Apiculture*. Order online at www.HorizontalHive.com.

About Dr. Leo Sharashkin

Dr. Leo Sharashkin is editor of Keeping Bees With a Smile, a comprehensive book on natural beekeeping, and Keeping Bees in Horizontal Hives: A Complete Guide to Apiculture by Georges de Layens. Dr. Leo is a regular contributor to Bee Culture and other major publications, and teaches natural beekeeping at his apiary in southern Missouri and around the country and internationally. His apiaries are entirely composed of survivor stock obtained by catching wild swarms, housed in a variety of horizontal hives, including the Layens. His website (including free hive plans): www.HorizontalHive.com.

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Pesticides In Colonies Linked To Honey Bee Deaths

Kirsten Traynor and
Dennis vanEngelsdorp, et al*

Honey bee colonies in the United States have been dying at high rates for over a decade, and agricultural pesticides – including fungicides, herbicides and insecticides – are often implicated as major culprits. Until now, most scientific studies have looked at pesticides one at a time, rather than investigating the effects of multiple real-world pesticide exposures within a colony.

A new study is the first to systematically assess multiple pesticides that accumulate within bee colonies. The researchers found that the number of different pesticides within a colony – regardless of dose – closely correlates with colony death. The results also suggest that some fungicides, often regarded as safe for bees, correlate with high rates of colony deaths. The [study](#) appeared online September 15, 2016, in the journal [Nature Scientific Reports](#).

“Our results fly in the face of one of the basic tenets of toxicology: that the dose makes the poison,” said [Dennis vanEngelsdorp](#), an assistant professor of entomology at UMD and senior author on the study. “We found that the number of different compounds was highly predictive of colony death, which suggests that the addition of more compounds somehow overwhelms the bees’ ability to detoxify themselves.”

The researchers followed 91 honey bee colonies, owned by three different migratory commercial beekeepers, for an entire agricultural season. The colonies began their journey in Florida and moved up the East Coast, providing pollination services for different crops along the way. They also spent time in locations meant for honey production, as well as “holding areas” where beekeepers prepare large numbers of colonies for upcoming pollination contracts.

A total of 93 different pesticide compounds found their way into the colonies over the course of the season, accumulating in the wax, in processed pollen known as bee bread and in the bodies of nurse bees. At every stop along the beekeepers’ itinerary, the researchers assessed three different parameters within each colony: the total number of pesticides; the total number of “relevant” pesticides (defined as those above a minimum threshold of toxicity); and each colony’s “hazard quotient,” a measure devised by other researchers to integrate the total hazard posed to each colony by the cumulative toxicity of all pesticides present.

*In addition to Traynor and vanEngelsdorp, study co-authors include Jeffery Pettis (U.S. Department of Agriculture), David Tarpy (North Carolina State University), and Christopher Mullin, James Frazier and Maryann Frazier (Pennsylvania State University).

All three measures correlated with a higher probability of colony death or queen failure. In addition, the researchers found between five and 20 different pesticide residues in every sample of bee bread that exceeded a hazard quotient’s safety threshold. The highest number of pesticides accumulated in the colonies early on, shortly after beekeepers placed colonies into early season flowering crops like apples and blueberries. Honey production stopovers and holding areas offered the bees some respite from further contamination.

The study results also suggest that some fungicides, which have led to the mortality of honey bee larvae in lab studies, could have toxic effects on colony survival in the field. In the current study, pesticides with a particular mode of action also corresponded to higher colony mortality. For example, the fungicides most closely linked to queen deaths and colony mortality disrupted sterols – compounds that are essential for fungal development and survival.

“We were surprised to find such an abundance of fungicides inside the hives, but it was even more surprising to find that fungicides are linked to imminent colony mortality,” said Kirsten Traynor, a postdoctoral researcher in [entomology](#) at UMD and lead author on the study. “These compounds have long been thought to be safe for bees. We’re seeing them at higher doses than the chemicals beekeepers apply directly to the colonies to control *Varroa* mites. So that is particularly concerning.”

The current study borrows a concept from human cancer research: the “exposome,” or the sum total of chemicals an organism is exposed to over its lifetime. But instead of looking at individual bees, the researchers assessed each colony as a single “superorganism” that functions as a single, cohesive unit.

Within this framework, the researchers tracked the death of queen bees, which is a life-threatening event for the colony as a whole. In some cases, a colony is able to create a new queen, but if those efforts fail the entire colony will die. In the current study, colonies with very low pesticide contamination in the wax experienced no queen events, while all colonies with high pesticide contamination in the wax lost a queen during the beekeeping season.

“This is a huge problem for beekeepers currently. Not long ago, a queen would typically last up to two years.



A honey bee forager collecting nectar from a cleome flower. Kirsten Traynor photo.

But now many commercial beekeepers replace the queens in at least half of their colonies every spring in the hopes that this will prevent premature queen deaths,” Traynor explained. “Even with such measures, many queens still don’t make it through one season.”

The research team did not find a significant contribution from neonicotinoid pesticides. These compounds, derived from nicotine, are currently some of the most common pesticides in use globally. Because of their ubiquitous use, neonicotinoids have received significant media attention for their potential role in honey bee declines.

“We just did not find neonicotinoids in the colonies,” vanEngelsdorp explained. “There were some trace residues of neonicotinoids in a few samples, but not nearly on par with other compounds. However, it’s possible we did not test the right matrix – we did not test nectar, for example – or that the product breaks down faster than others in the collection process or that neonicotinoids are simply not very prevalent when crops are flowering.”

Because industrial practices have changed since the researchers collected the data for this study, Traynor and vanEngelsdorp acknowledge that further research could reveal new patterns in the relationship between pesticides and honey bee health. But the current study nonetheless offers some important insights for beekeepers and farmers alike.

“We have to figure out ways to reduce the amount of products that bees are exposed to while still helping farmers produce their crops,” vanEngelsdorp said. “This will require careful examination of spray plans, to make sure we only use the products we need, when we need them, in order to reduce the number of products bees are exposed to while pollinating different crops.” **BC**



Honey bees storing nectar in comb.



Honey bees typically store incoming pollen in an arch above the brood nest.

The **research paper**, “In-hive Pesticide Exposome: Assessing risks to migratory honey bees from in-hive pesticide contamination in the Eastern United States,” Kirsten Traynor, Jeffery Pettis, David Tarry, Christopher Mullin, James Frazier, Maryann Frazier and Dennis vanEngelsdorp, was published in the online journal **Nature Scientific Reports** on September 15, 2016.

This work was supported by the National Honey Board. The content of this article does not necessarily reflect the views of this organization.

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FLOWER POWER

The Physics Of Pollination

Marie Davey

Pollination. The word brings to mind the droning buzz of fat yellow and black bumblebees bouncing from blossom to blossom in flower-decked meadows. But up close and in person, pollination is often anything but idyllic. The physical forces involved in pollination can be impressive, and both plants and pollinators must be well adapted to withstand them.

Take the bumblebees that visit potato (*Solanum tuberosum*). During pollination, bees violently shake the flowers with forces approaching 3Gs – or the equivalent of an astronaut blasting into space. The bees generate the force of a rocket engine by rapidly contracting their flight muscles, and the bigger the bee, the stronger the vibrations this produces. The potato flower's tolerance for this violent and rapid vibration is no accident either. They've evolved to both withstand these levels of force and to encourage their pollinators to shake them.

Why would a plant ask for this kind of abuse? It protects the pollen from being eaten by “cheater” insects that are too small to act as pollinators. Potatoes, tomatoes, and their close relatives have evolved what is known as *buzz pollination*. Their pollen is kept safe from small insects within tube-like structures called *anthers*, which open via a pore or small slit at the top of the cylinder. The pollen is dry and granular, but doesn't easily fall through these pores or slits. When a bumblebee on the hunt for pollen visits the flowers, it grabs the anthers and rapidly

shakes them. Pollen flies out of the anthers like a salt shaker, dusting the bee, which then carries the pollen to the hive or to other flowers, pollinating them.

It is not just plants that must resist impressive forces during pollination. The award for toughest pollinator goes to the euglossine bees that have evolved to pollinate *Catasetum* orchids. Early in the morning, these orchids produce a scent that attracts the bees. Inside the flower is a *pollinium* made up of two pollen sacs connected to a sticky disk of tissue called a *viscidium*. Two dangling antennae below the pollinium act as a trigger for this floral trap. When a bee visits the flower, it brushes the antennae, and the orchid launches its pollinium like an arrow toward the pollinator. The pollinium flies through the air twice as fast as a striking snake and sticks tightly to the back of the very surprised bee, which carries it off to the next flower it visits. The impact of the pollinium is the equivalent of a soda can falling onto a human from the top of a 10-story building, so it is impressive that the bees withstand this kind of abuse.

Judging from the fact that bees that have experienced this floral smack scrupulously avoid visiting male *Catasetum* flowers ever again, the sudden impact of the pollinium is a particularly unpleasant experience for the bee. It is no surprise that female *Catasetum* orchids have evolved to look very different from their male counterparts, so that the wary bees will visit them despite their previous experiences.

The flowers of bunchberry (*Cornus canadensis*) act like tiny pollen catapults that are triggered by bees visiting the flowers. Bunchberry flower buds have petals that are fused to one another and completely enclose the stalked stamens that contain the pollen. Because of the limited space within the flower blossom, these stamens are forced to bend as they grow, storing elastic energy in their springy stalks. When a pollinator forces open the petals or the flower matures and the petals open on their own, the elastic energy stored in the stamen's stalk is suddenly released, and the pollen is flung upward at speeds in excess of 20 km/h. The catapulted pollen either sprays the hapless bee that has triggered the sudden opening of the petals or is flung high enough above the flower to be caught and carried off by air currents.

But the physical forces at play during pollination are not just about speed and strength. Some of them are positively electric. Bees not only have the ability to sense electric charges through the fine hairs that cover their



Potato (*Solanum tuberosum*) flowers. Keith Weller photo.



Orchids (*Catasetum saccatum*). Larsen Twins Orchids photo.



Bunchberry
(*Cornus canadensis*)
lowers in
Ontario, Canada.
D. Gordon, E.
Robertson photo

Snapdragon
flowers offer a
non-slip landing
spot.



bodies, they also carry a charge themselves. Much like rubbing a balloon on a wool sweater can give it a static electric charge strong enough to make it stick to a wall, rapidly flapping bee wings rub against particles of dust in the air, giving the bee a positive static electric charge. Flowers and pollen, on the other hand, are negatively charged, so when a bee visits a flower, the laws of attraction come into play. The positively charged bee will attract the negatively charged pollen grains. Because of their tiny size, the pollen grains literally fly towards the bee and stick firmly to it. The bee's visit also temporarily changes the electric charge of the flower, which acts like an electric sign for other bees, warning them this flower has recently been harvested by another bee and may be low on pollen and nectar.

Sometimes pollination physics are a delicate, perfectly engineered balance. Snapdragon flowers (*Antirrhinum majus*) are tube-like, with an opening that is protected by petals that form two tightly closed lips. The weight of a bee landing on the lip of the flower causes its mouth to pop open, so the bee can crawl inside, rubbing against the pollen-containing anthers that are found around the rim of the tube. This trap door mechanism is another example of a flower protecting itself from "cheater" insects that would rob nectar and pollen from the flower without pollinating it. Insects too small to touch the edges of the

tube and get covered in pollen are not heavy enough to open the lips of the flower. As an extra insurance policy, the flowers also lay out an anti-slip welcome mat for the bees. At the microscopic level, the spots on the petals where a bee would land are covered in bumpy cells that increase friction and provide the perfect surface for the bee's tarsal claws to hold on to. Everywhere else on the petals, the cells are smooth and slippery, making it difficult for other insects to crawl up to the lips of the flower, especially in windy conditions.

If it's perfectly engineered bee size trapdoors in flowers or bees generating forces comparable to an average roller coaster, the physics behind pollination represent a marvel of evolution and impressive resilience. **BC**

Dr. Marie Davey is a researcher in mycology and molecular ecology at the University of Oslo with a PhD from the University of Alberta. She is interested in all aspects of science and its intersection with society, and has also worked as a science policy advisor and environmental consultant.

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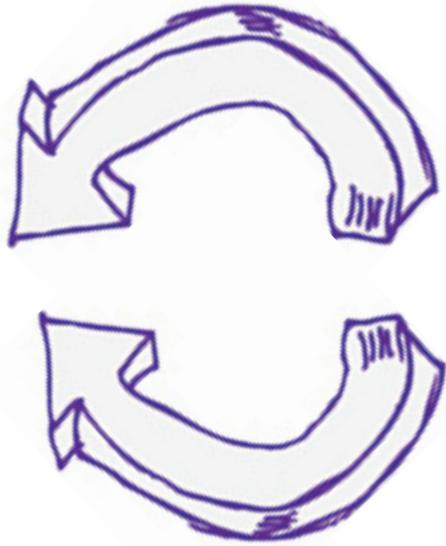
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Photo courtesy of Patrick D., NY.



SPIN AROUND QUEEN

Billy Davis

The Sustainable Honeybee Program (SHP) had its origin with a queen-rearing project back in the late 1990s. A location in rural Virginia offered good bee forage from February until frost in late October. I searched for and found Drone Congregating Areas to the northwest of the beeyard. Although this project was successful, over the years I realized that education of beekeepers was of primary importance.

The original stock of bees in the queen-rearing program was New World Carniolans for the queen-mother colonies and VSH for the drone-mother colonies. In the early days I had 176 nucs plus the queen- and drone-mother colonies. However we now know that as a teaching facility 40 mating nucs, plus queen-mother and drone-mother colonies are our absolutely maximum number. However, for genetic diversity the queens are open-mated.

Today the Sustainable Honeybee Program is a 501c3 organization that recruits volunteers who wish to become educated beekeepers. The purpose of SHP is **develop, educate, train and empower** beekeepers to keep their bees enjoyably, successfully, sustainably and stress-free. To put it simply, today SHP is a purely teaching operation where any development of equipment or supplies is secondary. The work is done by volunteers and interns who all wish to improve their skills as beekeepers.

We had been very fortunate that since 2006 we have not treated any colonies with a commercial manufactured treatment, especially a *Varroa* miticide. Until the winter of 2014-2015 we were running in the mid 90% survivors of all colonies and we were feeling very good. However, as Henry Wadsworth Longfellow wrote “into each life some rain must fall,” we had a series of problems – a significant bear attack coupled with a management error during the winter of 2015-2016 left us with 19 colonies out of 24 before the winter. The queen-mother colonies were lost during this time. We had to develop a plan for a rapid recovery of all our colonies, not just using the ordinary split, split and split.

Since SHP is primarily a teaching and developing operation I, along with the interns and volunteers, put in place a program called the Spin-around Queen. To develop this program everyone gathered at the local café and after multiple cups of coffee and scribbling on napkins, the way to recover using the queens still available was created. We called it the Spin-around Queen and here is how we replaced the colonies.

The equipment to develop the program used five-frame medium-depth nucs. The bottom board is screened and is divided so that two colonies can be set next to each other with entrances facing opposite directions. The tops used are not telescoping covers but are similar to migratory covers, allowing the nucs to fit closely next



Two colonies, side by side, coming out of the Winter before the spin-around procedure. The weaker of the two colonies will be put onto another base and moved away.



The colony on the left will be moved several feet every few days to a new location or taken to an outyard. The divided bottom board can be seen.

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Light blue drape covers the original lower body. Dark blue covers the empty body into which the capped brood will be placed. White top is on the original upper body sitting on an empty body to keep it off the grass. Pink box with blue cover contains the frame with the queen to keep her away from harm during manipulations. Open brood and the queen will be moved into the hive body with the light blue drape.



The majority of the capped brood is in the hive body with the white top. Field bees are seen returning from foraging.



The right-hand box, now containing the original queen, will receive a feeder and robber screen.

to each other. In addition there is an opening in the top for a syrup feeder.

Next select the weaker of the two colonies and place it on its own screen bottom board about two to three feet away. If this colony is to remain in the apiary it can be moved a few feet every three or four days. It can also be moved to an outyard or other location. This weaker colony

will not be used in making the Spin-around Queen.

Place an empty five-frame nuc hive body on the bottom board in the position vacated by the weaker colony and cover it. Remove the top hive body from the remaining colony, set it aside and cover it. Cover the lower hive body also. Inspect the frames in each hive body for two reasons – to find the frame with the queen and to assess the brood, food supplies and combs. Remove the frame with the queen and place it in a separate empty hive body and cover it.

Now the empty hive body that had been placed on the bottom board next to the original colony will be filled. Remember, its entrance is opposite that of the original hive next to it. (There is the source of the name ‘Spin-around Queen.’) First a frame with both pollen and honey will be put in position opposite to the original hive remaining on the bottom board. Search for and select frames with eggs and larvae. Minimize any capped brood where varroa may be hiding. If the frame with the queen also has clinging nurse bees or empty comb, transfer that whole frame. If she is on a frame with capped brood, transfer only the queen. If a fifth frame is needed, add one having only mostly open cells, but no capped cells.

Place a small (2X2-inch) piece of pollen substitute patty on top bars, Put on the cover and a feeder with 1:1 sugar syrup. This hive body has no guard bees or foragers. However it contains the queen from the original colony, next to it. Thus, this queen is now the Spin-around Queen because her colony now has their entrance facing a different direction from the colony she came from. Close this entrance for 24 hours. Then install a robbing screen and allow bees to fly. Leave this new colony alone for two whole days to organize and develop its guard bees and foragers.

This nuc, with its capped brood, is now a reservoir of varroa. To rid it of these mites, a break in the brood cycle will be performed. In the original nuc, next to the new one with queen, place a pseudo-queen (TempQueen Queen Pheromone, Betterbee item QP1) inside, since it does not have a real queen. The queen pheromone strip allows this colony to think it has a real queen for up to 21 days if necessary.

To give the nuc that brood break, a real queen will be present later. If a queen cell introduction is desired, do not put one in for nine days. If a caged queen will be used, introduce it after fourteen days. In either case remove the Queen Pheromone strip when installing either queen cell or caged adult queen.

With the Spin-around Queen method the SHP was able to increase colony numbers 60% during the first season. After two years of using this method it appears that an 80% increase is possible.

With some modification, other equipment, such as eight-frame and 10-frame, can be used. These sizes of hives would not use a divided screen bottom board but individual screen bottoms. The original hive is not moved away but a five-frame nuc is set next to it as the Spin-around-Queen nuc that will be expanded to a complete colony. Making the Spin-around-Queen nuc gives that nuc a break in the brood cycle.

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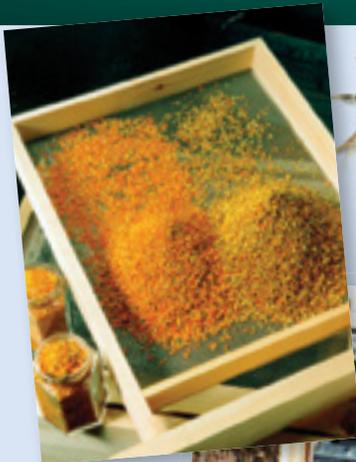
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SWARM INSTINCT

Barbara Gillette

On a late sunny afternoon in early August, intuition calls me out to my small apiary of three hives. I checked my girls yesterday, and all seemed in order. Hive #1 continued to cap their one super of honey. I had placed sugar syrup on top of this year's nuc. Despite the fact that Hive #2 had good numbers, plenty of honey and was certainly Queenright, they had steadfastly refrained from moving honey up into their single super. I left the super on to afford them some extra space. There would be plenty of time after the Autumn nectar flow to feed them up for Winter. I saw no signs of mites, beetles or wax moth. Everything looked good. In normal circumstances, I would wait another week to recheck.

I have no scientific explanation for this calling; this urgent need to check the hives, but I have experienced this "gut" feeling a number of times during my nine years as a novice beekeeper. I always go, because, I have learned that something is always up. And something was. Hive #2 was wild and alive with swarming behavior. Bees were gathered at the front of the hive and hundreds were circling. I recalled hearing a new queen pipping when I checked the hive the day before. There was nothing to do but wait to see where they landed and see if I could capture the swarm.

I drove our golf car out into the area of the apiary around dusk that evening to search. If these bees followed a normal swarming pattern, they will have landed on a nearby structure to wait while scouts flew out to look for a new permanent home. My apiary is located in an area of about three acres of restored prairie. Some years ago I had planted a couple of Bradford Pear trees there. The trees, often valued as an ornamental landscape tree, had

been given to me, and, as an early Spring bloomer I valued them as an early food source for my hives. The truth is, the Bradford Pear can be a weedy invasive, not much liked by my bees, and popping up everywhere. I now had several dozen scattered throughout the prairie, most of them untrimmed saplings with low twiggy branches and prairie plants and grasses crowded around the base. I circled around the prairie searching for any sign of activity to no avail.

Early the next morning I was back out on the prairie and it didn't take long to locate the swarm. They were nestled into a low crook on one of the sapling trees, halfway up the trunk, and on the dozens of twiggy stems and grasses around the base, not more than 30 feet from the original hive. This was not going to be easy. The swarm was fairly big but somewhat scattered making it impossible to guess in which cluster the queen might be. For the beginning beekeeper and those who have not experienced a swarm, the swarm queen is



usually found in the center of a large cluster of worker bees. If the queen can be moved into the trap or catch box, the worker bees will follow. I gathered some equipment together, including a wooden nuc box with three frames of drawn comb and my bee brush. The brush is a soft bristled hand tool used to gently brush the bees into the box.

I returned to the swarm and set about my first task which was to remove the grasses from the base of the tree, along with as many of the low twiggy branches I could manage to clip off. Then I began to use the brush and the swarm erupted. We often hear that swarms are gentle, that they have nothing to protect. Not so in the case of

these Texas bees. The sting pheromone permeated the air and several times I had to walk away until the bees settled. Back to the bee house for the smoker and a few more tools. I needed to really think this through and be smarter than the average bee.

This time I returned to Hive #2, the hive from which the swarm had originated. I pulled a frame of honey and a frame of brood, carried them to the nuc catch box and exchanged them with two of the frames of drawn comb. I took the drawn comb back to Hive #2 to fill the empty slots and closed up the hive. Then, back at the swarm, I used my smoker fairly generously and began to scoop bees up in my gloved hands and release them into the nuc box. I went right for the biggest clump of bees and must have gotten the queen for, within minutes, the workers were making rapid progress toward the box.

I left the bees to gather in the box and when I returned a couple of hours later the box was filled to the brim and bees were spilling over the sides. Back to the bee shop for a deep hive, I returned to the swarm with the deep and seven frames of drawn comb. Two inner covers with the holes taped closed would serve to close up the deep box full of bees so that they could be moved back into the beeyard. I attached one inner cover to the bottom of the deep with strong tape. Then, using my smoker to calm these aggressive girls, I lifted the three frames from the catch box, now covered with bees, and placed them in the deep. Then I picked up the nuc box, turned it upside down over the deep and gave it a good shake. Once I had

as many bees as I could possibly retrieve, I used tape to attach the second inner cover on the top of the deep, effectively sealing the bees inside. I placed the box in the handy tool bed on the back of my golf car and moved the entire new colony into the bee yard where I had set up cinderblocks, bottom board, a shim, and a top to complete my new hive. I carefully added three more frames of drawn comb and left the inner cover taped to the bottom of the deep for a couple of hours, to give the bees a chance to crawl up into the frames. When I returned to remove it, I added the remaining frames of drawn comb, a quart of syrup as a top feeder, and an entrance reducer. The bees would have two small entry/exits from the shim and the inner cover for the next 24 hours.

Friends and family often ask why bees swarm. Scads of material are available. The bottom line, I believe, can be attributed to instinct. Might we consider that, at times, the beekeeper shares that instinct and experiences a “knowing” when the bees are about to swarm? Perhaps this is simply another myth to add to the fascinating hobby of working with bees. For me it is part of the magic.

When I began my journey with honey bees, I was fortunate to have two excellent mentors; women who had a combined 20 years of experience. Their advice and assistance has proved invaluable. Most of all, they taught me that there is always more than one solution. As beekeepers we can find ways to support our hives, to increase and to achieve success. We just need to listen to the bees and trust our intuition. **BC**

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Get Your Bait Hive Ready!

Morris Ostrofsky

Recently I was corresponding with a German friend for whom English is a second language about bait boxes. It seems that I was referring to enticing swarms with a temporary hive with frames and boxes while he was thinking about the type of box used for storing and transporting fishing gear. Once that was cleared up (with some mutual embarrassment) I realized that there was an additional similarity. With both fishing and catching swarms the first successful catch is memorable. In short you are hooked.

Here's some practical uses for bait hives, suggestions for when and how to set them up, placement strategies and how Oxalic acid can help eliminate 90% of the *Varroa* mites before moving a swarm to a standard hive.

Bait boxes are used during swarm season with the goal of attracting swarms. These swarms may be from your own or from other colonies. Of particular interest may be swarms from feral hives. In addition to just being fun, there are many practical uses for bait boxes:

- Instead of a swarm leaving one of your hives and flying off into the sunset, a bait box can provide an easy way to lure them and prevent a loss of bees. This is helpful if you are gone at the time the swarm issues from one of your hives.
- An easy and practically free way to increase your numbers. The swarms literally come to you.
- Provide the opportunity to capture feral swarms. In my opinion the greatest potential value can be achieved by placing bait boxes in locations that are in the vicinity of feral hives that have been continuously occupied for three or more years. The greater the distance from managed hives the greater the likelihood that the captured swarm came from a feral colony. If these bees are doing that well, even without being treated, these are the swarms you want. Ideally these colonies may have developed a tolerance or resistance to *Varroa* mites.

A swarm of bees in May is worth a bail of hay.

A swarm of bees in June is worth a silver spoon.

A swarm of bees in July is not worth a fly.



There are various renditions of this saying. Regardless of the verses the take home message is that swarms captured early in the season are more valuable than those caught later. Be aware of when swarms start in your area. The goal is to have the bait boxes in place when the scouts start looking for a new home. Here in the southern Willamette Valley, Oregon, the first swarms start around April 1. I set up my bait boxes around three weeks before this date.

Bait hives come in a variety of designs. They range from standard hives to molded paper mache plant pots. While the plant pot containers are convenient, I do not recommend using them. Not only are they expensive but it can be a mess to transfer the bees and comb from them to a standard hive. Removing comb from these can result in lots of dead workers and possible queen loss. This is especially true with remote boxes that are not checked on frequently.

I choose either a Langstroth deep with a solid bottom board or a cardboard box depending on where I place them. I use Langstroth bait boxes in an area I consider to be secure such as my or a nearby friend's property. In these locations there is little or no chance of vandalism. An important advantage of using standard Langstroth deeps is that the volume is consistent with Dr. Tom Seeley's recommendation of 40 liters (1.4 cubic feet). Additionally the deep frames can be moved into and out of a box making it easy to transfer them into a permanent hive later.

When using a Langstroth deep the entrance must be reduced to two square inches with a block of wood. Again this is consistent with Dr. Seeley's research results on bait hives. He found that scout bees preferred this size when given a choice. The down side of Langstroth deeps is that they are heavy. So safety can be a concern if the box is positioned in an awkward location or in a tall tree.

I use cardboard bait boxes in remote areas (two or more miles from managed colonies) where the possibility of loss is higher. The investment is minimal so if the box is vandalized it is not as much of a financial loss. I have



Cardboard box with drawn frame in back, starter strip toward front. You are looking at the entrance end.

found local home improvement stores to be a rich source of free cardboard boxes. Armed with a tape measure I select boxes approximately 20 X 16 X 10 inches. These dimensions are close enough to those of a Langstroth deep; 40 liters (1.4 cubic feet). I use a long staple to attach not only the frame rest but also the outside handle to the box. Including the handles gives the box greater support and ease of handling when transporting it.

Regardless of which bait box I use, the configuration of the frames within the box is the same. One old drawn brood frame FROM A HEALTHY HIVE is placed at the end of the box opposite the entrance. This frame serves as an attractant to the scout bees looking for a new home. It also acts as a pre-made location for the bees to start housekeeping. One possible problem with drawn frames is wax moth damage. If the wax moths are actively chewing up the wax, the scout bees will find this offensive and avoid the box. The drawn frame can be protected from wax moths with a biological control called *Bacillus thuringiensis* or Bt. (formerly marketed as Certan). This is a Bacillus spore that is non-toxic to bees or people but deadly to wax worms. The product is now marketed as XenTari and can be found on the internet.

In addition to the drawn frame, I place nine wired frames with foundation starter strips in the remaining



Moving in.

space. The open space created by using starter strips vs. full sheets of foundation makes it easier for scouts to measure the volume of their prospective home. Starter strips also act as a guide when the bees quickly start building new comb. As in any situation when using starter strips, the box should be level. The wire supports newly made fragile comb so there is no damage when being transported.

The final addition to the box is the application of a lure. Last Spring I tried a new product called Swarm Commander Swarm Lure. This swarm lure was formulated to mimic the “Nasanov” pheromone which is used by workers forming a swarm cluster. In the past I used lemon grass essential oil. I have found Swarm Commander to be more attractive than lemon grass essential oil. I increased the number of swarms I caught this year to 10 from a previous average of one to two a season. The lure should be refreshed about every two weeks.

Other than the entrance, the box should be completely sealed so no light or water can enter. The entrance should measure about two square inches, or a round hole about 1 ¼ to 2” in diameter. A nail placed across the entrance will discourage birds from taking up residence in the box.

When trying to attract a swarm from your own apiary, the bait box should be at least 300 yards from your own hives. When choosing a remote location, look for an area that has older trees and is at least two miles from managed colonies. Ideally the box will be about 15 feet off the ground. This is not always practical. I have attracted swarms to a picnic table top. The bottom line is to consider the ease of box’s placement, retrieval and your safety. For a more detailed description of bait box guidelines see “Bait Hives for Honey Bees” by Dr. Thomas D. Seeley Information Bulletin #187 Cornell Cooperative Extension publication.

Swarms offer an opportunity to start a colony off almost mite free. Oxalic acid and Hop Guard can be used to deal with *Varroa* mites while still in the field. This way you can avoid bringing a mite bomb into your apiary and you can deal with a mite population that is phoretic (outside of brood cells). Swarms with mated queens do not produce brood for at least the first three (3) days after going into a bait box; it takes 15 days for virgins. The time to take advantage of the opportunity to treat is limited but worth the effort to give your new colony a healthy start. Follow the label directions for either product.

I usually leave the occupied bait box in place for at least two weeks before moving it to my apiary.* I find moving it early in the day before the bees are flying is the easiest method. A screen can be attached over the opening to insure that the bees will stay put until you are ready to release them. If you used a wooden hive box be sure both the bottom board and the cover are securely attached. If moving a cardboard box, make sure all the tape is secure and that dampness hasn’t weakened the box.

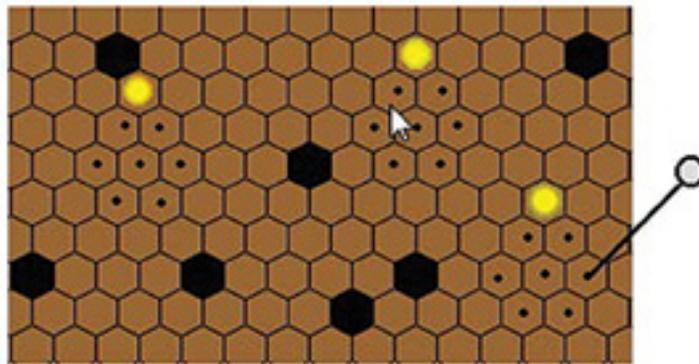
*The exception to leaving the swarm in the bait box for two weeks is for those who live in areas occupied by Africanized bees. Africanized bees do not show defensive behavior until they start producing brood. While you still need to reduce the mite population, the existing swarm queen must be replaced before she starts brood production. Move the swarm to your apiary after controlling the mite population and requeen immediately. Use a marked, hygienic queen to do this.

Let the bees settle for a couple of days before transferring them to a permanent hive. This is where using movable frames makes this step quite easy on both the beekeeper and the bees. If the new colony does not have brood at the time you transfer them, give them a frame of open brood from another colony. This is very effective in preventing them from absconding.

One and a half to two weeks after you have transferred the bees to your apiary, you should see the first capped brood. One of the ways to improve the genetic make up of your colonies is to test for hygienic behavior. The Pin Prick method is simple and does not require any special materials. Cappings of newly sealed brood cells are punctured with a fine pin to kill the larva beneath. After 24 hours, the number of cells uncapped and cleaned out are counted and recorded. After several replications under different environmental conditions, colonies which have cleaned at least 90% of the cells within 24 hours are considered hygienic. See the Glenn Apiaries website (www.glenn-apiaries.com) for specific directions.

Colonies that exhibit little or no hygienic behavior can be requeened with a hygienic queen. Note the assumption is that any *Varroa* mite infestation was previously controlled before the captured swarm was taken to your apiary. If this was not done, *Varroa* must be dealt with prior to requeening. Defensive temperament or a poor brood pattern are also good reasons to requeen with commercial queens that are advertised to have hygienic behavior. In areas that are known to have Africanized bees, the queens should always be replaced with marked queens.

I have a different strategy for my bait boxes for the Spring of 2017. My long term goal is to establish an apiary that requires the use of less miticides. My focus will be to place bait boxes in remote locations. Because the bait boxes will be placed away from managed colonies, I hope to capture feral swarms issued from colonies that have the genes for mite tolerance or for hygienic behavior. I plan



Hygienic test from Glenn Apiaries.

to check the bait boxes every three days. Checking this frequently will allow me to determine when the boxes are occupied and take advantage of the limited opportunity to deal with mites. When I see bees busily going in and out carrying pollen it will be a sure sign that the box is being used as a new home and not merely being scouted.

Once I determine that a box is being occupied, I do not plan on moving it for at least two weeks because I want the virgin queen to be mated in the remote area. I will wait this long to account for afterswarm queens who need approximately 10 days to be mated and to start producing brood. If the weather has not been good enough for a mating flight, I will leave them longer than two weeks. While the odds of capturing a swarm with the hoped for genetics are low, I believe it is worth the effort and it is a lot of fun too.

Catching swarms in bait boxes is like receiving a genetic box of chocolates – you never know what you are going to get. **BC**

I would appreciate hearing from you after trying the suggestions outlined in this article. Please contact me at Ostrofsky@pacinfo.com.

2017 Price List

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Young Harris Institute



It's amazing how many meetings and workshops one could attend around the county, state, or country. This week alone at only one of the two convention centers in Athens, Georgia, you could attend the Georgia Landfill Operator Certification Training, peek into the 33rd annual Marriage and Family Therapy Institute, or hang out with a bunch of Optometrists. Now, for beekeepers, you could venture to Galveston and spend four days at the North American Beekeeping Conference. This Summer you could hang for a week at either the Eastern, Western, or Heartland Apicultural meetings. In one month, I could attend 39 local club meetings here in my state of Georgia. We also have two Georgia Beekeepers Association state meetings (one in Spring and one in Fall), plus at least six bee schools. Combined, that makes a yearly grand total of 478 bee meetings in the state of Georgia alone. WHAAATTTT!!!! Now add up all the thousands of clubs and their meetings across the U.S. – that makes for a LOT of gatherings about bees! Guess we humans love to be together, but more importantly, we love to get together and discuss what we are most passionate about: our bees.

Over the years I've been to a few meetings, from the local clubs with maybe 15 folk to the larger conferences with 1000s. The one thing that all these groups have in common is they want to learn more about bees, mingle with other beekeepers, see or hear about the newest gadget, and talk about their experiences. Exciting, right? And probably a lot more exciting than hanging with a bunch of Optometrists (just kidding – love y'all). Some of these meetings are fantastic, and some not so much. I think what makes a meeting stand out, percolate to the surface, rise to the top – it's the energy in the room. It can be with five people or 5,000 people. It's not the size

of the crowd that matters; again, it's the energy in the room. And that energy usually stems from those putting on the show. And a show it is, whether a one-nighter or a week-long event, you're experiencing a show.

Each year we put on a show. For the past 25 years, the University of Georgia Honey Bee Lab along with Young Harris College has been putting on the Beekeeping Institute, a show that I am partial to and one that has proven to be one of the best bee events for years in the Southeast. So, how did it all begin?

Twenty-seven years ago Dr. Keith Delaplane (my boss) was giving a lecture on tracheal mites at a county agent meeting in North Georgia when he met Dr. Paul Arnold. Keith, fairly fresh to the Georgia scene, and Paul, a new faculty member at Young Harris College, both hit it off immediately. They started communicating about putting together a "beekeeping short course". Delaplane's predecessor, Dr. Al Dietz, had presented a short course for years at the UGA Bee Lab, located south of Athens. The short course was great, but the bee lab facility was small. It did not allow room for growth, and it was not as picturesque as the North Georgia Mountains. So, without much thought, they both



Jennifer Berry



UGA/Young Harris Bee Institute founder, Dr. Keith Delaplane, left and Dr. Paul Arnold.

decided to have the bee school on campus at Young Harris College. Shortly thereafter, Robert Brewer, Towns County Agent (since retired) was brought in to lend a hand. Now with a location and plenty of hands on deck, it was just a matter of putting together a curriculum. In 1992, Keith went to work.

Apparently, the trio had the right recipe for success because 26 years later the UGA/Young Harris Beekeeping Institute is still going strong. It has become one of the most comprehensive and educational beekeeping events in the country. Why do I proudly say that it's one of the best bee meetings?

To begin with, it's location, location, location. Our meeting is held in the small, not-tiny town of Young Harris, on a campus tucked in the Blue Ridge Mountains of Northern Georgia. The facilities are conveniently located, modern with room for vendors and their very own cafeteria stocked with a soft-serve ice cream machine, with sprinkles, hello!!! The area has great food venues, lodging and scenic views.

Next we invite only top notched researchers and beekeepers who are not only good on their feet but have interesting and important information to share. For instance in 2014 Dr. Marla Spivak, a MacArthur Fellow and distinguished McKnight Professor from the University of Minnesota, gave amazing lectures about honey bee social immunity and predictors for colony survivorship. Two years prior Dr. Tom Seeley, Professor of Neurobiology and Behavior at Cornell University and



UGA Lab Technician questioning a potential certified beekeeper during the practical exam.



Keith Fielder (left) and Robert Brewer welcoming Melissa Bondurant as a new Welsh Honey Judge.

award-winning author, talked about his amazing research and experiences with honey bees in the wild. Dr. Mark Winston, Maryann Frazier, Dr. Dennis vanEngelsdorp and Dr. Jim Tew are just a few more examples of the stellar presenters that have graced us with their marvelous research and beekeeping knowledge.

We also bring folks occasionally from across the pond, which have been a huge hit. Dr. Yves Le Conte director of the Research Unit for Bees and the Environment, in Avignon, France, Dr. Giles Budge research coordinator for the National Bee Unit at the Food and Environment Research Agency in York, England and Michael Young founder of the Institute of Northern Ireland Beekeeping, Senior British Honey Judge, international chef and inspiration for our own Welsh Honey Certification program.

Then we have the local favorites, which over the years have been very instrumental in making the bee institute world class. There's Keith Fielder (who has taken over Robert Brewer's duties), Carl & Virginia Webb, PN & Evelyn Williams, Bill Owens, Bob Binnie, Dan Harris, Will Montgomery, Cindy Bee, Lonnie Funderburg, Jim Quick, Cindy Hodges, Phillip Quinn, Nicholas Weaver, Brett Nolan, Damon Wallace, Cyndi Ball, Will Dix, Amy Weeks, Michael Steinkamp, Tom Rearick, Kim Bailey, and Mary Cahill-Roberts.

With nationally known speakers and these locally talented beekeepers, the institute offers an array of interesting topics and expertise. Our programs are always geared to bring to the students not only the cutting edge research, but practical beekeeping information that they can take home and apply in their own apiary.

But wait; there's more! We also offer training and certification for the Georgia Master Beekeeping Program, which launched in 2002, an intensive program designed to provide participants the opportunity to increase their knowledge about all things dealing with bees and beekeeping. There are four levels to the program beginning with the Certified, next Journeyman, then Master and finally Master Craftsman. We have passed three Master Craftsman, 50 Master Beekeepers, 30 Journeyman and 620 certified beekeepers over the 14 years the program has been in existence. It takes students years of hard work and dedication to persevere through each stage. Plus, it's more than just memorization for a written exam; there's a practical portion for the Certified and Journeyman as well.

This program not only offers the students the training



Juliana Rangel and Gary Reuter taking a break.



Mark Winston and Jennifer Berry take a break.

but also the confidence and material to teach others about bees and beekeeping. As my boss puts it, “The Georgia Master Beekeeper Program gives its participants not only the opportunity to learn, but also a sense of responsibility to teach others about the miraculous honey bee, the enjoyment of beekeeping, our shared dependence on pollination, a concern for the overuse of pesticides & shrinking forage-habitat in our environment, and the techniques of honey production & distribution.” As a side note, we have also passed 47 inmates at the level of Certified Beekeepers in three of our state’s maximum-security prisons. The Georgia Master Beekeeping Program is a win:win for all involved, especially the bees.

We also offer the Welsh Honey Judge Licensing program which originated at the UGA/Young Harris Beekeeping Institute in 2001 when Michael Young, Welsh Honey Judge, visited from the UK. He was instrumental in partnering the Welsh Honey Judging system with the US. The program offers training and certification for honey show judges at the highest standard. The Welsh training is the most stringent of its kind for aspiring honey judges in the world. UGA and the University of Florida have the only two partnerships of their kind between the US and the UK.

For our 25th anniversary, we expanded the Institute to four days with training for the Master Beekeeping Program

and Welsh Honey Judge training on Wednesday and the institute proper Thursday thru Saturday. Plus we’ve increased the number of attendees, without sacrificing quality. We did this for two reasons. One we moved across the street to the newly built Rollins Campus Center, which offered plenty more space. And two, we wanted to offer more seats for eager participants since each year we were selling out within weeks of registration opening.

And if you order in the next few minutes – our Institute is also known for its comradery and socials. It’s important for participants to not only have full days of “schooling” but also have time to talk with folks and to make new friends. Friday nights we set aside for a traditional low country boil where we stuff ourselves with shrimp, sausage, corn, and potatoes, and wash it down with a local variety of beer. We also like to include some of Georgia’s finest musicians to play during the event. Like my grandfather used to say while organizing our annual family reunion, “To have a good show, you must have good food, good booze, and good music.” And I will say, my grandfather knew how to put on an excellent reunion.

We consider our beekeeping institute to be the Harvard of Bee Schools and we will continue, hopefully, for years down the road to provide excellent education and fun to beekeepers from all ages, all walks of life and all areas around the world. If you are interested in attending our event, or want more information, please go to our website www.ent.uga.edu/bees and click on the Young Harris Beekeeping tab. This year registration opens the first week of March. Hope to see you there. Take care of you and your bees! **BC**



Dewey Caron enjoying a cold beer after a long day of lecturing.



Blue grass musicians entertaining the crowd.

The Trials And Tribulations Of A

New Delaware Bee Club

Nobody said it would be easy. It wasn't.

Dewey Caron

Starting bees can be a challenge. Starting beehives and a new bee club doubly so. For a dozen senior residents of the shore region of Sussex County, Delaware, both were successively accomplished this past year.

The Delaware Atlantic Shore area (at 28 miles in length only New Hampshire has a smaller Atlantic shore), is a haven for retirees and hordes of Summer visitors; Cape Henlopen State Park, Delaware State Seashore, Rehoboth, Dewey, Bethany and Fenwick Beaches are all popular summer resorts. Within the curve of Cape Henlopen State Park, sits Lewes, western terminal of the Cape May (NJ)-Lewes Ferry. Lewes is home to the Osher Lifelong Learning center. This past Winter, a five-week beekeeping class was offered at the center and a new Lewes Bee club started by class members.

Beekeeping course instructors were Dean Hoover, a retired University

professor (mathematics) from western NY, with a life-long fascination with bees and Tom Lord, a retired University biology professor from western Pennsylvania. The course, the first such offering at this senior-teaching division of the University of Delaware, enrolled 23 students for the five week mini-course.

Dean learned beekeeping 30 years ago helping a 100+ semi-commercial beekeeper in western NY and once had as many as a dozen colonies himself. With retirement and move to Cadbury village, a retirement facility along the DE shore, he rekindled his interest in bees. He built and stocked an observation hive in the library of his retirement facility and then started a standard hive on an outside patio.

Tom was teaching math courses to seniors at the Osher Life Long facility while Tom, a naturalist by training and inclination taught a number of natural science/biology courses

at the facility (a converted public school). As friends, they decided to team together to put together the first offering of beekeeping.

The two accomplished a goal that might be the envy of any beekeeping course instructor, inspiring nearly a third of class members to join together and start beekeeping. Two additional class individuals also started bee colonies on their own, contributing to the new club.

Course participant Denise Bridgens organized eight class individuals, mostly older women (who are by far the majority of Life Long course participants), to join together to become beekeepers. Denise who “. . . became fascinated by bees” recruited six more members (“. . . it wasn't hard finding others to join”) and one of those, brought in a friend, so the initial club count was 15 individuals. Denise organized the first club meeting in Mid-February, even before the LifeLong learning class had finished. A treasurer was appointed and Denise volunteered to keep members informed of club activities via email.

Course instructor Dean provided an estimate of costs for the purchase of the bees and hives. So within a month, each founding member invested \$90 so the club could start two hives. The new equipment (one medium 10-frame Langstroth and three shallow boxes per hive) was purchased and a committee of assemblers put the boxes, covers and bottoms, as well as the frames, together. Equipment of one hive was painted pastel green and the other painted yellow. Assembly was part of one of the Life Long learning classes, with Dean, a skilled woodworker, supervising.

After some searching, an apiary site was established at Black Hog Farmstead in Lewes close to the



New beekeeping club assembling hives.



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Bob Mitchell (center without veil), DE apiary Inspector, before green hive during disease inspection.

community where most of the participants lived. Two three-lb packages of Russian Bees, each with a marked queen, were ordered from Kelley Beekeeping. The packages arrived May 7 and were installed Tuesday afternoon May 10 by three club members into the medium depth box, with Dean's assistance. Feeders were added above the inner cover and then weekly replenished with syrup. Dry pollen was also fed close to the hives.

The weekend following the installation Denise shared with the group "The bees are safely ensconced in their bee box which they travelled in from KY. I just checked in on them and they are happily buzzing. We have our two hives at Black Hog Farmstead prepared with sugar syrup as well as some bee bread (protein based pollen cake) to provide them



Hives prepared for hurricane. Kathy Kelly wacking weeds.

with immediate sustenance. Looks like they are content and clustered near their queen who is in her own separate box within the overall larger bee box. They are lively and have started making comb in one hive. As you can imagine and will soon see for yourself, there are lots of flowering plants already for the bees to forage, so all should go well."

One of the two hives (yellow hive) released their queen within two days but then started comb building inside the package itself, rather than on the foundation. The comb was manually removed within the first week; the green hive had a normal start, immediately starting normal comb building on the foundation. It's queen was released after the 2nd day from her cage.

Of the 15 original founders, seven members remained active in club and colony activities for the entire season while the rest maintained some contact, at least through emails from Denise. Four individuals made almost weekly visits to check on the bees. After their first solo visit, Denise emailed club members "it felt like a big milestone, at least for me, to open the hives, remove frames, install traps and feeders, and close it all up smoothly and w/o a bee sting or upset bees or beekeepers. And we did it all in under an hour." It became evident a number of club members had only joined to support pollinators overall, not become beekeepers

However, as sometimes happens with new bee colonies, everything did not go as planned. The yellow hive continued to be a problem. In a June inspection, the yellow hive was described as "noisy" and as less robust. Developing queen cells were detected in the yellow hive. Within a couple of months Denise's emails to club members continued to describe the green hive as getting bigger and even had supers added but the yellow hive was clearly not doing as well.

Denise and a few others, including the two individuals who started their own hives, began to attend the Sussex County branch of the DE Beekeepers' Association meetings (each of the three DE counties has their own county association as affiliates of the State Organization). Denise shared summaries of the bee meetings, called attention to (and attached to her emails) interesting bee information and continued the

progress reports on the club colonies. Monthly meetings included tasting of honey and wine brought back from travels of members, along with updates on the two colonies.

A big event for the club was a June visit by Bob Mitchell, who recently retired as DE apiary inspector. Bob met the several active members at the Black Hog Farmstead apiary and showed them how to do a hive inspection. He provided timely advice during the disease hive inspections. Bob found most of the brood in the first super of the green hive, so he revised the hive architecture, reversing the shallow with the empty brood so the bees would expand upward into the medium, the 'intended' brood box.

Bob removed the two empty honey supers on top of the yellow hive. In the green hive, the bees had chimneyed in the three supers (i.e. drew or partially drew frames up the middle of the three boxes, ignoring the outer frames), so he consolidated frames into the medium brood box and 1 honey super. He explained that the club should plan to add more supers once the bees filled up the 2 boxes using the 70-75% rule. Bob pointed out the difference between the stronger green hive and the weakness of the yellow hive.

As new beekeepers, the Club had one issue after another to figure out. Small hive beetles were detected by Bob Mitchell. He treated the soil with Guardstar and recommended purchase of SHB traps. During an inspection, trough syrup feeders were thought to be breeding grounds for the SHB, especially in the yellow hive. This particular feeder was a new design and although it looked promising, it seemed to cause too much syrup to drip into the hives when initially inverted and shellaced bees caught in the dripping. So a one-gallon inverted pickle jar was exchanged for the original feeder.

In August, Denise wrote club members. "Our little bee club has a big problem with bald faced hornets being all over the yellow hive. . . We will not be able to open the hives to feed the bees anymore and I fear the hornets will wear out and kill all the yellow hive bees and then go after the green hive which is two feet from the yellow hive." A bald-faced hornet nest was discovered in bushes immediately behind the hives.

After some decision-deciding emails, and discussion with the Farmstead owners, it was decided to eliminate the nest with a hornet and wasp spray in the evening.

The hives were also treated for varroa mites. Denise wrote the members “This morning we also treated for the deadly varroa mite you hear so much about – we applied two Apiguard treatment packs to each hive. We did a test last week using the bottom grid boards to check for *Varroa* mites and didn’t see any. However, we are being proactive by treating . . .”

In late August, the two hives were prepared for potential arrival of Hurricane Hermine. They were strapped to the hive stand (see photo). Thankfully, the hurricane passed without incident.

In mid-September Denise shared the bad news with club members: “I’m having concerns about the bees. At first glance, it seemed the bees were doing alright but after thinking more fully, the yellow hive bees are getting weaker every day. Here’s one absolutely critical [thing] we didn’t consider at all and I think our oversight on this issue could be our biggest undoing... The yellow hive can’t forage and we didn’t see one bee with pollen going into the yellow hive after having spent significant time observing the activity. It is just a full-on defense posture for the yellow hive.”

When it was clear the yellow hive was lost, Denise’s notes to the club membership when it was opened included:

Beekeeping windbreak using recycled campaign signs.



1. What appears to be black mildew or mold around the base and the stand’s legs as well as many dead bees inside.
2. There was white “cobwebby” material between the frames and hanging off some of the frames [wax moth]
3. The deep loaded with frames, was very lightweight and completely robbed of honey stores and brood cells gone. So sad.
4. Lastly, we have these little black bugs which look like termites and have wings, crawling on the outside as well as inside plus a smaller version which has a red head [earwigs].

There was some good news to share as well. There was an eventual harvest but not of the club’s green hive. Dean Hoover, their instructor from January was joined by half dozen club members who assisted in helping him harvest approximately

25 pounds of cut comb honey from his balcony hive at the Cadbury Senior Center where he lived. It was thought the Honey from Dean’s hive the “best ever” they had experienced.

The club has begun to conduct outreach activities around their beekeeping venture. An informative article on the new club was published in the local newspaper the Cape Gazette during the Summer. Ed Hynes, one of the class (and club) members who started his own bee colonies to pollinate his vegetable garden, is a Master Gardener volunteer and every chance he gets talks about the value of pollinating bees. His vegetable garden was on the local Lewes Garden Tour this past Summer. Club members, assisted Ed by being docents by his hive, providing overviews of what bees do, how they do it, etc. during this event. They also have assisted the Black Hog Farmstead owners, where their two hive apiary is located with outreach.

Plans are underway to replace the yellow hive next year. With assistance of the Sussex Branch of DBA, the club will purchase a nuc to repopulate the yellow hive. The club constructed a Winter windbreak from recycled 4X8 election campaign signs, donated by a local candidate, for the surviving green hive. The screen bottom board will remain open for ventilation.

Several members are planning to journey to northern DE for the annual Eastern Apicultural Society Conference and Short course (July 31-August 4, U of Delaware, Clayton Hall Conference Center, Newark DE) where they will have the opportunity to share their club founding and success story with EAS. **BC**

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Writing Beekeeping History

How Vermont Is Making It Work

Bill Mares and Ross Conrad



The Story of One State's Beekeeping History – How some Vermont beekeepers are going about it and why you should consider publishing a history of beekeeping in your state – By Bill Mares and Ross Conrad

The *History of Vermont Beekeeping* project began as nothing more than a whim, when at a Vermont Beekeeper's Association (VBA) summer meeting several of us began to discuss a history of Vermont's beekeeping as a whole.

Why write a history of beekeeping for a state? The value of history is that it can shed light on the future and the present—connecting all three aspects of time. History can also be interesting and provide us with a perspective on where we are today. Folks accepted and enjoyed their lives even though their situation may be considered primitive or uninformed compared to ours. It can also connect people with each other and help convey strength and power to those who share a history, helping to provide a sense of identity. When history is recorded it has the advantage of being analyzed easily and understood more than the present or the future. Ideally, history helps us to learn from the past (how previous generations approached the many challenges we still face today), learn from past mistakes and provide the opportunity for us to realize past dreams that never came to fruition.

In the late 19th century, Vermont State Agricultural Department reports included speeches from prominent beekeepers between the 1870's and 1890's. A number of beekeepers (all men) had 300-500 hives. They gave speeches which were a mixture of description and exhortation to the backyard beekeepers of the day, primarily (probably) farmers just beginning to explore how beekeeping could fit into their farm life.

In 1900, Mr. R.H. Holmes, president of the VBA reminded his audience that, *"The honey season in Vermont is short at the best and the time for procuring surplus honey is sometimes limited to a few days, and in no occupation is the old maxim more true that our dish should be right side up when it rains porridge."*

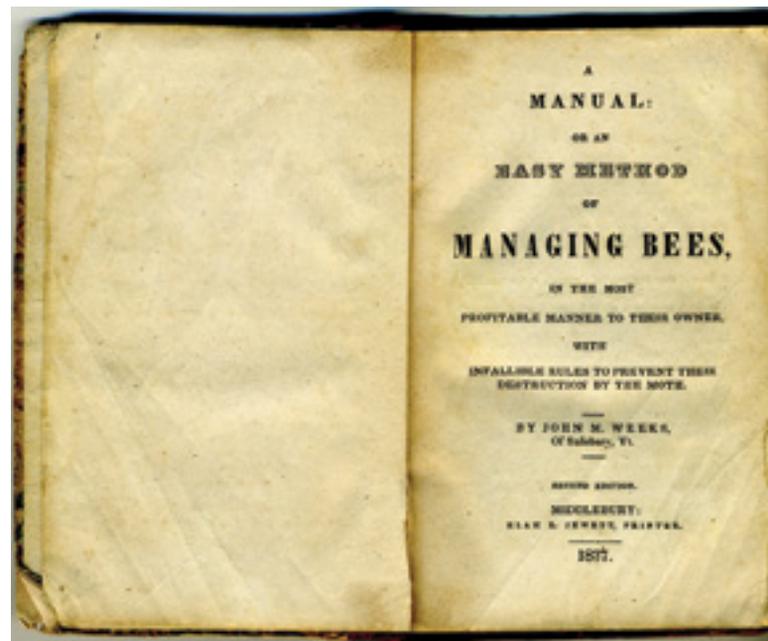
Books on the History of American beekeeping (Pellett) and the World History of Beekeeping and Honey Hunting (Crane) have already been published. In this article we will describe how we are working to assemble a history of beekeeping in Vermont, and exhorting you all to do something similar in your own states.

Bill had written a book on the American beekeeping industry, so he signed up. Ross had done a book on natural treatment-free beekeeping, so he signed up. Even more germane, Ross was already working on a history of Addison County beekeeping, the Vermont region which has always been the epicenter of beekeeping in the State. To help spread the work load, Bill and Ross persuaded a backyard beekeeper (Larry Solt) and two part-time commercial side-liners (Scott Wilson and Larry Karp) to join in. Previous book writing experience is not a requirement for this kind of project, but if you have it, you at least know what you're getting yourself into.

We ended up blocking out four logical chronological periods. They were 1780-1860; 1860-1910, 1910-1980, 1980-2016. We understand that the information will be different for each period and that each of us has a different writing style. In essence the approach we are taking is to string together four historical essays.

Each person is responsible for their own period, but whenever any of us come across something of interest, we share the information with the others.

We hope to build a narrative thread--we are telling a story after all, embellished by important people and events. The challenge is how to build that.





Our research so far is multi-faceted. We are able to use the archives and collections of the Agency of Agriculture, the State Historical Society, the University of Vermont's Bailey-Howe Library and collections at local museums in the Addison County towns of Ferrisburgh and Middlebury. The second block of research consists of interviews with some of the major Vermont beekeepers of our day, as well as some of the living state apiary inspectors. Third, we have notes from bi-annual bee association meetings, and a bi-weekly VBA newsletter that was published for six years.

As for meetings and coordination, our team began with a meeting over beers at a local brew pub. Since then we have communicated mostly by email.

Although we are all working relatively independently, we have agreed on some basic ground rules. The template we are all using has four variables. People, Trends, Techniques and Particular Events. We also acknowledge that no beehive or beekeeper is an island, particularly in the latter 20th Century. On the other hand, we are NOT writing a history of U.S. beekeeping and so while we may make reference to the national beekeeping climate at times, in order to provide some context for what was taking place in Vermont, our focus is primarily on what happened within the state.

Soon enough, we confronted the writer's dilemma-not just what to put in, but what to leave out. Since we are not writing an encyclopedia of beekeeping, we have to keep a tight narrative. One avenue we have settled upon is the preference for vivid anecdotes over broad generalities.

Although we are all new to this type of project, we have some ideas about what you may want to consider based upon our experience so far should you decide to take on the challenge of writing a history of beekeeping in your state.

Create a budget – Decide if you will pay your writer(s) and how any royalties from the sale of the publication will be distributed. Even if you don't decide to work with a publishing house, it's relatively easy and inexpensive to self-publish these days but it still costs money (about \$2,000-\$3,000 minimum). Some potential sources of funds include state bee associations, the personal finances of those involved, and a publisher.

Identify your audience – Like rings in a pond, the impact of a history of beekeeping in Vermont is going to ripple out into the community and beyond. We are writing this primarily for our VBA members and current Vermont beekeepers. At the next level, are fellow Vermonters

and historical societies who are interested in Vermont's agricultural history, as well as libraries around the state. Finally there are people in other states who may not just find the history of beekeeping in our little state interesting, but may be inspired to pick up pen, computer and tape recorder and set out to do similar work in your state. The final potential audience is the anonymous "general reader."

Set a deadline – you're not in competition with anyone, but you can get stuck in the quicksand of "just one more" person, fact, idea, etc., leading you to never finish. Bill played the role of the class scold and gave us a deadline.

Decide on roughly how many pages and/or chapters – You may also want to have a rough idea of how many illustrations you want to include. Be flexible here. You don't want to leave out critical elements or fantastic photos due to arbitrary limits.

Research – The modern computer age makes research (via internet) easy and accessible to all. Just don't overlook old-school sources such as beekeeping books and journals, such as *Bee Culture* and the *American Bee Journal*, for articles or references about beekeepers and beekeeping happenings in your state. For example, we found a couple of references to Vermont and Vermont beekeepers in the History of American Beekeeping, by Frank Pellett. One tip is to make note of references that cite the source of your information AS YOU GO ALONG. Trying to backtrack and locate sources for your statements and facts is time consuming and can be frustrating.

Examine documents – As indicated above, sources of agricultural records may include your state and local bee associations, government agencies, historical societies, folk-life centers, and museums. Check the archives. In the first months, we hit a gold mine at the University of Vermont's Bailey-Howe Library's Special Collections department, where we found biennial reports from Vermont state bee inspectors that ranged from 1910 to 2001, which gave us a solid fact-laden chronology. Not only did we find random articles about things like bee-lining and town histories about people like John Weeks of Salisbury, Vermont, but the State Agriculture Department bi-annual reports were a trove of information on inspections, diseases, pests, weather, honey yields, etc.

Always look for "characters" and their "stories" – It is the characters and stories that we believe will help make a state's beekeeping history more interesting and accessible to the average reader. Of course you will include the large commercial and famous beekeepers that have received national attention and exposure, but don't overlook the characters. You will find them, but not just in publications and reports, so be sure to interview your state's beekeepers. Start with the "old-timers" that are tucked away in the hollows . . . while they are still around! They are a wealth of information, stories, and can offer a perspective that you may not find anywhere else. We have interviewed a number of professionals and side-liners as well as two state beekeeping inspectors, who between them, covered the last 35 years. Ross interviewed members of two prominent beekeeping families the Manchesters of Cornwall, Vermont and Mrazes of Middlebury. (See the December 2015 issue of *Bee Culture*). From them came suggestions and stories

about the previous generation of beekeepers, some of whose names had turned up in the State reports.

Hire a professional editor – None of us write deathless prose; we need that objective eye. Just be sure to include the cost of an editor in your budget since unless you have a professional editor in your beekeeping organization, this is where most of the money is likely to get spent.

The *History of Vermont Beekeeping* is a work in progress and our hope is to have it published sometime in 2018. Such efforts especially if duplicated in other states will go far in helping to document and save our state's beekeeping histories . . . histories that often get glossed over when the focus is on a national or global level.

As far as we can tell, if we are successful, Vermont will be the first state to publish its history of beekeeping. However, we hope we will not be the last. We encourage those of you who decide to take on such a project to remember that one size does not fit all, but quilts all look alike from a distance.

In the early 1980s Vermont State bee inspector, Rick Drutchas, came upon some abandoned hives full of American foulbrood. He told the farmer's son that the hives were a menace and he would have to return to destroy them. "Whatever," he said.

Drutchas continued: "In about two weeks I came back with my assistant Dick Brigham. We knocked on the door and the farmer's son comes to the door. He looked as if he had been crying. I told him we were here to burn the hives and we'd talked to his mother about it.

"He turns and pointed toward the living room and



there she was laid out on the sofa, dead.

"Really embarrassed, we said, 'Oh, my Gosh, we'll come back later!'"

"But outside, Brigham said, 'Let's not wait, let me talk to this guy.'"

"So gently but insistently he told the son that we'd dig a hole, bury all this equipment and burn it up and he wouldn't have to worry about it.

"Then the son said, 'Well, we could use tractor to dig the hole. And would this be today?' he asked.

"Absolutely!" Brigham said.

"The son started to smile, and he said almost to himself, 'Won't that make the neighbors think!'" **BC**




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DOWNTOWN

Building Community By Killing Varroa

Here's an admission: I have been complaining a lot about urban beekeeping lately. For my first six years, I never lost a hive, in part because there just weren't very many of us then, in part because I had the good fortune (pure luck, actually) of replacing a package queen early with a Kona Carniolan sold to me by EAS Certified Master Beekeeper Bill Troup. That line has survived my many mistakes since 2005. But here in Washington DC, where we got a late start compared to New York, Chicago, London, San Francisco, and (insert your city here), we are now just about equally as dense, and I lose a lot more bees these days. In previous articles, I have emphasized how this makes raising the bar on management decisions, especially for newbees and those hypnotized by Internet promises from completely unrelated environments, much more difficult and important. It is not all thorns among the roses, however (or should I say asters, which are far more useful to honey bees).

In the cities, we also have access to major universities with impressive science labs that are often better funded for pollinator research these days. Being in the MidAtlantic, in this column I write a lot about the vanEngelsdorp Lab and the BeeInformed Partnership at the University of Maryland/College Park, as well as our invaluable neighbors at USDA/ARS Beltsville. Though at least one entomologist at one of these centers was once advised to go run a couple of hives before designing experiments and management recommendations for

us, the great beekeeper unwashed, I am afraid that the idea for the program described here belongs completely to Dr. vanEngelsdorp at UMD. It depends, however, on the closeness of the beekeepers downtown, in both geography and community.

We have used these advantages before to organize a city-wide Swarm Squad that assigned an excited beekeeper to every single swarm (that didn't skip) last season within an average of 20 minutes—and which put up with many calls for Carpenter bees, yellow jackets, and bald faced hornets, as well.

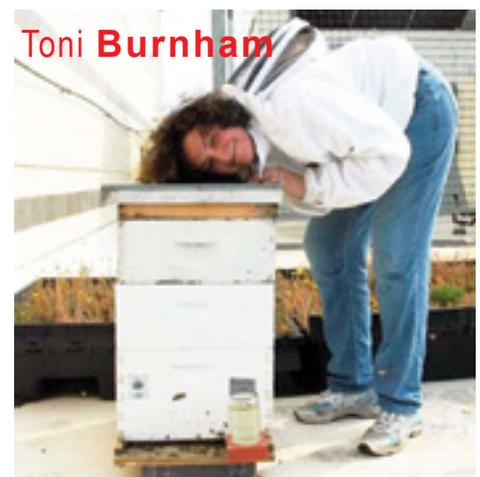
This winter, we are working on a herd health approach to *Varroa* control. Dr. vanEngelsdorp told us about cattle diseases in the Midwest that had been contained by region-wide vaccinations of herds. There are also examples of Foot and Mouth Disease control in the EU handled in a similar fashion (where, like honey bees, diseases of managed stock were leaking into wild populations). Perhaps in a contained space such as an urban center, we actually have a shot at a similar approach. There are over 200 registered hives in DC right now, though, which indicates we probably have between 300 and 400 managed colonies stashed around.

So, the DC Beekeepers Alliance has made wintertime oxalic acid fumigation a benefit of membership, and we allow beekeepers in town to both pay (\$15) and sign up for a visit on our web site. We flog this on our social media and in our meetings. One of our members, Jan Day, has developed experience with a few dozen hives and has been creating methods and measures for application. We have only fumigated 30-40 hives so far, but with the publication of happy photos of beekeepers all over town, in

widely different apiary settings, more and more candidates trickle in. We would like to hit 80% of colonies in order to get a recordable benefit, but this is unlikely to take place in our first year, until rhapsodic reports of healthy fumigated hives (we hope) ring in the ears of folks with year-on-year losses.

We are using lessons learned from the Swarm Squad to organize ourselves. While in our early phase we can only go to the relatively small number of early adopters spread all around, we will eventually organize large groups, and take on one neighborhood at a time on a Winter weekend day. The beekeeper is given a time, and must be there. Not advertised publicly and with permission, we will also fumigate all hives in a shared apiary, even if one or some belong to a non-member. Drift is just too much of a fact.

We chose cold weather oxalic fumigation as our method based on recent studies that indicate that popular miticide applications during the brood cycle (*Gregorc, Adamczyk, Kapun & Planinc, 2016*) have limited effectiveness. In our region, July and August temperatures



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The car jumper that worked.

(considered the recommended post-harvest window for treatment) are also too high for many widely used treatments for weeks on end.

There were considerable lessons and practicalities for the community fumigation program to overcome. Urban hives are often on garage or townhouse roofs, and Jan had been stringing 30-foot lengths of jumper cables from her car to get to some eager apiaries. It was not clear that we could get to herd health without better access. Initially, our club purchased the same portable car jumper that you can see in the Honeybee Health Coalition videos (<http://honeybeehealthcoalition.org/Varroa/>), which is a Black and Decker, and which *for us* failed right out of the box (yes, we followed the charging instructions. The thing is actually manufactured under license in China, and has about as much relationship to their usual quality standards as my dog's squeak toy. I also ordered it from Amazon and



Sherry Cohen and Jan Day at the Friendship community Garden Apiary.

could not return it). Next time out, I went to Home Depot and bought the no-name (to me) version pictured here that apparently does not enjoy enough brand recognition to be sold for profit to a manufacturer that otherwise produces flammable hoverboards. I tested it on my back porch (and jumped my husband's 40-year-old Mini Cooper) before trying *that* again. It certainly took a charge, and we did 15 hives in six apiaries during Weekend One. I think we should now spend the money to buy one that could jump a semi, and go absolutely wild.

We discovered that our two fumigation wands required somewhat different periods to heat effectively and vaporize the oxalic. This caused concern about battery life versus number of hives: we perceived that jumping a car usually does not require a sustained charge over five minutes over and over, and we wondered whether our equipment was a good fit for longer applications. The first time we did multiple hives (13 at the Franciscan Monastery in Brookland) it also took about 20 minutes per hive as we wrangled the woodenware into the right configuration (entrance reducers out, bottom board inserts in) and figured out the timings for heating and vaporization.

We have since told all members that they must have their equipment ready ahead of time, and per-colony timing has been halved. A checklist of all required fumigation equipment would have been helpful the first time out (can you believe that I forgot the oxalic?) and at least two applicators *plus* the beekeeper speeds the course. We have the experienced person (Jan) explain, set up, and perform the first vaporization, with the owner beekeeper at her side as helper. Both are in an N95 (or better) rated mask and wearing gloves! I think goggles are a good idea, but they didn't get much traction. The third person (me) stood away using a cell phone stop watch app as a timer, calling out relevant intervals (every 30 seconds

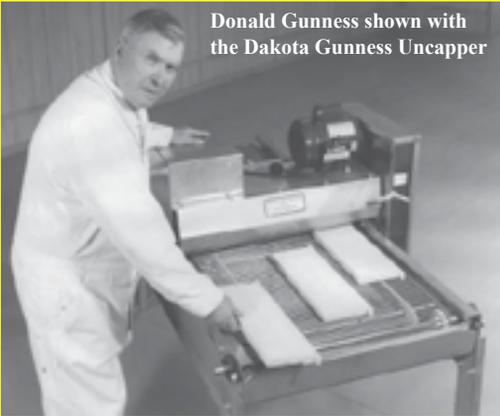
or so. For us, it took about two minutes to achieve required heat, maybe three minutes to guarantee that all the oxalic had burned off, and five minutes of chewing the fat before removing the towels blocking the entrance, and replacing the entrance reducer). It is hard to be understood while wearing the mask, so I stood 10 feet or so away, upwind. I was also usually just able to smell when the burn started from this position (maybe not too wise), and to inform the team. Where there were additional hives, we cajoled the owner to manage the wand the second+ time. We want *lots* of beekeepers to feel empowered to do this.

We wonder whether we have what it takes to scale all the way to 300 colonies, and whether we are collecting enough or the right kind of data to measure effectiveness. The BeeInformed folks mentioned that grant funding might help. We have never done that before, so that's something more to learn.

But what we really want to say is, despite my habitual doom and gloom lately, this is something highly positive that we can try because of the assets and proximity characteristic of a large urban area. One neighbor club in the suburbs is making noises about trying it, too. There is joy in visiting a lot of living colonies in January. Maybe, if we get somewhere with this, we will finally find the time and the teamwork to get going on breeding local survivor bees, on getting our neighbors to knock it off with the ineffective mosquito sprayings, and drowning their expensive cultivars in neonics – on huge honey harvests that make the public (and our friends and families) fall in love with bees all over again! **BC**



Chandra Harris vaporizes her own hive.



Donald Guinness shown with the Dakota Guinness Uncapper

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*Brian Buoye
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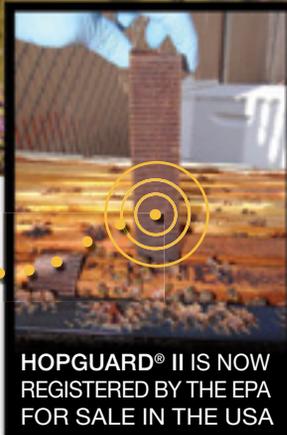


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REFRAMING

Finding A Better Way To Fix Frames

D.E. Bentley

The frames, strung up between trees on clothesline, looked like an art installation with their cast shadows and deliberate arrangement. I had hung them in the sun after ripping out rectangles of darkened comb, in the hopes it would soften the hardened on propolis and remnants of solidified wax while, perhaps, providing some beneficial UV. It was right about at this stage that I started fantasizing about a massive solar wax melter – supers full of spent frames dripping in the midday sun, pouring out a spout at the bottom like liquid gold.

Shaking free from my fantasy, I opted for scraping. With hot weather settling in and basswood blooms opening, many of our colonies needed growing room; they blanketed the fronts of the supers. We had left this task for far too long, and had an immediate need for new frames to rotate into colonies and make splits.

Knowing what the right thing to do is and doing it are two different things. I know that regular clean up and maintenance of woodenware and rotating older darkened comb frames out are crucial activities for keeping bees happy and healthy. Yet, after years of moving myself and my bees to our new home I found myself pawing through stacks of frame filled supers trying to locate the least dark

comb, while mumbling apologies to the girls every time I gave them one of these frames to try and clean up and store honey on - some of which they wisely refused to work. Although offering colonies older frames allows one to quickly assess which hives demonstrate hygienic behaviors, as piles of debris rapidly accumulate at hive entrances, it is just bad beekeeping practice.

In an attempt to avoid the work at hand I had already ordered additional frames; it is more fun to assemble than to scrape. Still, if I left the older frames sitting around they would turn to wax moth mush – making the clean up even more unpleasant. Beyond the stockpile of stripped down frames that needed clean up and foundation for immediate use, there were many older frames in the honey supers that would need to be rotated out and cleaned up after extraction. Most of the older frames were still solid and could be reused, and I had foundation on hand.

I had run out of excuses.

Procrastination is the mother of invention: sometimes a short delay in action is all that is needed to come up with a better way of doing things. In the past, I often scraped frames on a tarp, shaking the pieces of wax and propolis periodically to the center then into a bucket. This had the benefit of catching the scrapings for later candle making, but put wear and tear on my knees and back. What I wanted was a standing scraping station that would provide a surface for scraping frames, and supers, while catching the scrapings for easy collection. Using an acquired nightstand and assorted odds and ends, I assembled a sturdy, albeit ugly, scraping table, then set to work scraping down frames and replacing foundation.

The scraping table proved to be a timesaving contraption that also saved on chiropractic fees. It holds a super for cleanup and provides an abundance of solid surfaces to rest frames on for scraping. The sloped

sides feed most of the scrapings into a drawer for easy removal. I dump the collected scrapings from there into a trashcan. The bottom shelf provides a storage area for tools. Hanging bars on either side hold frames, allowing me to load un-scraped frames on one side and transfer them to the other once cleaned up.

As I scraped down frame, after frame, after frame, I thought about my decade of beekeeping experience and my decision to move the bees with me. I had transferred colonies first to some vacant acreage an hour from where I was staying, and then to their new permanent location - as my new beekeeping and life partner photographed from the sidelines. This movement of colonies gave me a brief glimpse at the life of a migratory beekeeper, and reaffirmed my commitment to keep my bees, and me, stationary - I like to be attached to a piece of land where I can plant things and watch them grow.

Pollinating crops was the prime objective when I first started keeping bees. I still value the bees' function as pollinators, but have realized that I now keep bees because I enjoy keeping bees. Beekeeping is a lot like martial arts-*you have much to learn, grasshopper*. As with martial arts, in beekeeping one must be prepared for the unexpected, move with calm deliberate actions and conquer fears. Likewise, there is the acceptance that what we know is a miniscule drop in the ocean of knowledge. The meditative time working the hives, the challenges associated with keeping bees alive (and well), watching the bees fly to and fro or flit about on flowers, exploring the world of honey plants and even the related tasks of maintaining equipment and extraction still holds me captive. Even the mundane task of scraping frames has some hidden allure, although I did sketch out preliminary plans for a solar wax melting unit, which I plan to construct in the "near future" - a flexible timeframe, as any beekeeper is aware. **BC**



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Beeyard Thoughts, Observations, and Updates

This month can we just talk?

Today is dark, cool, and raining. Good time for conversation

In this article, can we just talk for a bit? I know that Winter kills, making splits, ordering packages and other such topics are common threads at this time, but I would just like to chat for a while. I don't mean only to reminisce, reflect or predict, but just talk about bees and beekeeping for a bit – and yes – and some other stuff, too.

If you have kept bees long enough, you know that our craft becomes a descriptor for our lives. In the grocery store as I try to decide if I will eat whatever it is that I am considering purchasing, I get, “Hey, Jim, how are the bees? I heard they are all dying?” “That’s really too bad!” “Bees are important you know!” Actually, I do know that bees of all species are under stress, but at that moment, I only wish to decide if I want sardines that are packaged in Poland or China.

In church, I get something like, “Good morning Jim, I saw where bees are now endangered.” “That’s not good!” (Then from a nearby parishioner who cuts in, “Hey, don’t upset him. He’s got millions of defenders that he can unleash on you!”) All the while, we are handshaking and back patting – just socially interacting. While I don’t mind the attention, in some form, it is nearly **every** trip to the grocery, to buy gas, restaurants, or church that such interactions occur. (Plus, it was a species of bumbles and not honey bees that were recently listed as endangered. Should I have gone into that with my friend or just move along my way? I chose to move along.)

I’m glad people feel comfortable

speaking to me about bee things, and in my own way, I am helping bees by encouraging people to read and remember bee news items so we can interact. As a beekeeper, you do exactly the same thing and the same thing happens to you. You understand what I am talking about.

What’s in a name?

This bee intro thing is a lot like common interactions with my surname, “Tew”. At a piano recital in which my grandson had just finished playing, a fellow completely unknown to me said, “Tew – that’s an Anglo-Saxon name from the London, England area.” I was truly stunned. He was the first person in my entire 68 years to know my name’s derivation. He said it with complete confidence and knowledge. He was correct and yet, I don’t know who he was.

A few years ago, my wife and I visited Great Tew, Lesser Tew and Dunn Tew all in the outskirts of London. It was truly an interesting part of my life to visit the area where some of “my folk” (apparently) once lived. (No doubt, my ancestors were kitchen staff in some manor house.)

To many, if not most people, my surname sounds Asian. I can understand that perception, and there is no harm in the thought. During the Vietnam War years, Nguyen Van Thieu¹ was president of South Vietnam. Thieu (sounding very much like Tew) was frequently on national news. That was a confusing time for all Tewes.

It is interesting to me that people

¹While confirming spelling and pronunciation, I found that Thieu died in 2001 at 78 years old in Boston, MA.



readily pronounce words like *pew*, *dew* and *few* but when confronted with Tew, they tend to pronounce it Twe (rhyming with “tree”). Of course, relating my name to *one*, *two*, *three* is always a hoot for some. It’s okay; I’ve grown completely accustomed to it. It’s a common conversational ice breaker.

Why am I putting you through all this?

I am an oddly named guy who keeps bees – which is also odd to most people. It could sound like this at a noisy social event – a stranger reads my name badge and cautiously asked, “Is that pronounced Tewe?” Then very shortly thereafter upon explaining that I am there for beekeeping, within the hubbub, the stranger will again tentatively ask, “Did you say bookkeeping?” I have few doubts that as our conversation ends and he moves on, he must be thinking “Well, that was certainly a strange guy.”

Why am I putting you through all of this? Because we all are beekeeping promoters – even when we do not



Directional sign outside Great Tew.



Bee Boles in my home town, Great Tew (grins).

particularly want to be. But our beekeeping interest is something that other people can use to interact with us. It makes for easy – if not predictable – conversation and pleasant social interactions.

Can you believe this?

Only a few minutes ago, I got a county extension office request to suggest a beginning beekeeping book for a class in which I will be involved. Piece of cake, right? I have no idea which one to choose.

Hardly 10 years ago, I purchased just about any bee book that came to the market on just about any bee subject. Not now. There are too many new (and old) ones available. I confess that I did not buy a lot of cookbooks, or fictional bee pieces, but even a few of those books would occasionally call to me. Currently, beekeepers new and old are awash in new (and old) bee books. Choosing one written text for a county extension educator is a surprising task.

Within eBooks alone there are 73 bee digitized title listings that I could quickly find. In our new, electronic world, essentially, anyone can be an author (or photographer). To get on

top of the bee book pile, some authors use titles with something like *super adjectives* or hyperbola. (I was going to list some “*extreme*” examples of titles and descriptors, but I do not mean to highlight or insult any author.)

But eBooks are only an infant compared to the listing in *Archive.org*. If you want to review what must be hundreds and hundreds of bee books and even download – free – to your reading device to read at your leisure, you can do it at this site. There are videos, webinars and podcasts also. The amount of information is staggering – once again – for free.

For example, amongst all the old and new books that are archived, a host of early versions Root’s *The ABC of Bee Culture – A Cyclopedia of Every Thing Pertaining to the Care of the Honey Bee; Bees, Honey, Hives, Implements, Honey Plants, etc., Facts Gleaned from the experiences of thousands of Bee Keepers All Over Our Land and Afterward Verified by Practical Work in Our Own Apiary*. Is that a title or what??!

Of all the hundreds available, I randomly moved on to E.F. Phillips, “*Beekeeping – A Discussion of the Life of the Honey Bee and of the Production of Honey*.” (1915). Dr. Phillips included a short review of women in beekeeping in his beautiful old book. He came so very close to being greatly ahead of his time one hundred and two years ago, but alas, he blotted it. He wrote that women could easily become beekeepers and be very proficient at the craft, (*good, good*) but they could never excel without a man to provide physical labor. (*Boom!*) But that was the only limiting factor he gave – physical strength. In every other way, women beekeepers were as able as men. It is not for me to decide how much credit he should be given for acknowledging

women beekeepers so long ago. At least, he mentioned them. The remainder of the book is sterling. The line drawings are great.

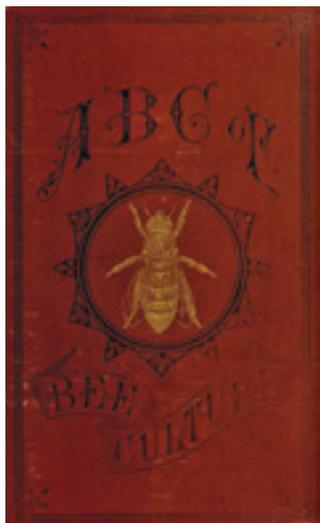
My comments here are not a comprehensive review of Internet resources

I am unqualified to offer anything other than fortuitous resources that I have stumbled across or that others have directed me to. Indeed, as a newish senior citizen, I work daily to keep up with electronic changes and advances. I am doomed to lose this race, but how I do enjoy trying. My justification for all my electronic efforts is my fundamental love of beekeeping.

The amount of information on the Internet (both correct and incorrect) is astounding – if you can figure out how to get to it. Try not to be sidelined into buying replacement windows or be prodded into downloading suspicious software that is guaranteed to speed up your computer. (*...and when you are not using it, cover the camera on your computer.*)

More stumbling onto bee stuff

I have the same TV set up that everyone else has. It offers more television than I could ever watch in several lifetimes. Maybe it’s just me, but it seems that most of it is not for me. From my perspective, there are some good programs out there, but finding them takes some serious time.



The 1880 cover of ABC of Bee Culture.



A woman beekeeper producing comb honey (1915). From Pellett, Beekeeping.

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My daughter suggested that my wife and I tune into a series called *Black Mirror*. The series has been on since 2011, but since I apparently live in a cave and am always the last to know anything, I was not aware of the program. It is suppose to be a latter-day *Twilight Zone*. I liked the program reasonably well but it is not something that I just could not miss. (*This is not a TV program review. I have no qualifications to judge such things.*) Last night, a *Black Mirror* presentation entitled, “*Hated in the Nation*” came up on my list. It aired on October 16, 2016.

I popped some corn. My wife and I settled in for some “typical” TV. Typical TV cops investigating a couple of mysterious murders. The program was set a few years in the future. The story line unexpectedly broke away to what appeared to be a honey bee on a blossom. It was robotic bee – a drone. Not a male bee but an autonomous flying machine. (*I didn't see that coming.*) A complex explanation followed. “As CCD continued to kill off pollinators, the ecosystem became unstable.” (Remember, this is TV jargon.) A robotic pollinator was developed that was based on (oh so very loosely) honey bee biology. These robotic bees formed hives where they in computer/robot fashion reproduce themselves. Off they did go – in vast numbers – to robotically pollinate flowers. But wait, as murders continued, it was discovered that there was a sinister government shadow plan to use mechanical bees for other sordid purposes. From there, the plot thickened and became interestingly goofy.

When does a reviewer stop? I suppose there is a slight chance that

some of you Netflix bee people will check it out. It cannot be considered educational TV. A loud warning – there is a significant amount of gratuitous foul language used in this show.

If you could only be here...

In the same vein of Internet resources and robotic bees, there are reasonably well-developed systems for streaming video from multiple sites to an even greater number of download sites. Skype is the best-known system, but there are many other systems available. *Go To Meeting*, *Zoom*, *Adobe Connect* and *Scopia* are some that I have used, but I am still a neophyte. Video conferencing was in its infancy when I retired from Ohio State more than five years ago. It rages now.

When these video streaming events are being set up, someone must always say what everyone is thinking, “*It would be so much better if you could just come here.*” (*A sad sigh follows the comment*) In no way do these digital events supersede the presence of a speaker, but it slashes the amount of time and money required to get the information out. The procedure greatly reduces the speaker’s time commitment. But do not fear, live speaker-lead presentations will not be vanishing anytime soon.

Editor Kim and I (*It was not my idea. No credit is due me.*) are developing a procedure for using video-conferencing in a production named *The Kim and Jim Show* that we’ve done about four times now. More episodes are in planning and we hope to move outside when the weather changes. That will probably

be good for several audience laughs.

Simply stated, events like these are terrifying to develop and produce. Why? Because there are so many variables – some that demand simple good luck. It is very easy to look really inadequate in short order when things go wrong while you are “live”. This form of presentation must be a bit like a performer from silent movies trying to develop a persona in speaking movies. Speaking to a group and speaking to a computer screen are NOT the same thing.

There was little that I did in my earlier career to prepare me for this format. Other than occasional texts, there is little audience feedback. There are no IT specialists in my shop when we are live. I am alone. Any problem is my problem – live. Whatever dumb thing I say is being recorded and will be played again and again and my chair is prone to squeak when I pivot. *Is my audio still on? Drat! I should have covered all that junk behind me. Maintain eye contact!*

Certainly others are using this technology. Kim and I are not unique. The ones we have done are parked at: BeeCulture.com. Once there, in the very top black ribbon, pull down the category “Events” and then click on *Kim and Jim*. One of the presentations had audio issues, but even so, a photo deck of the show is posted there.

A beekeeping canon

I want to know more from you who have used the oxalic acid canon that is used to fumigate colonies in hives without opening or really doing much with them. I know nothing about it. I’m still becoming confident with the oxalic acid wand.

Thanks to all who read to this point.

Thank you for reading to this point. I realize this has not been a typical piece for you and me. I will be back to *typical* next month. **BC**

Dr. James E. Tew, State Specialist, Beekeeping, The AL Cooperative Extension System, Auburn Univ; Emeritus Faculty, The OH State Univ. Tewbee2@gmail.com; <http://www.onetew.com>; [One Tew Bee](http://www.onetew.com/feed/) RSS Feed (www.onetew.com/feed/); <http://www.facebook.com/tewbee2>; @onetewbee Youtube: www.youtube.com/user/onetewbee/videos

The screenshot shows the Bee Culture website header with the title "Bee Culture" and subtitle "The Magazine of American Beekeeping". Below the header is a navigation bar with links for "BEEKEEPING", "LIFE", "SCIENCE", "BEEDEVELOPS", "OPINIONS", and "ENTER THE BEEZ". The main content area features "THE KIM & JIM SHOW" with a small image of the hosts and a pull-down menu for RSS feeds. The menu options are "All News", "Bee News", "Beekeeping", and "Beekeeping & Beekeeping".

The Kim & Jim pull-down page on BeeCulture.com.

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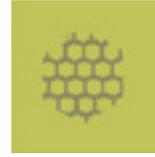
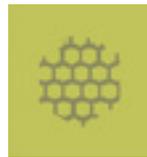


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Jessica Louque

Conventional Wisdom

This year, we went back to Galveston, TX for a multitude of conventions. Not only was the American Beekeeping Federation being held in the convention center, but it included the American Bee Research Conference, American Honey Producers Association, Canadian Honey Council, Apiary Inspectors of America, Canadian Association of Professional Apiculturists, American Association of Apiculturists, and there might have been a few others I missed. It's always great to have everyone share the meeting because the turnout is so much better and there are more presentations to see.

One of the most interesting presentations I was able to see was by Dr. Gloria DeGrandi-Hoffman on nutrition and varroa research where she used Randy Verhoek's bees to compare overwintering in warm climate versus in cold storage, and came up with healthier bees at lower costs in cold storage. We were also pleasantly surprised to see a presentation come up from UNCG that was co-authored by one of our newest hires, so we now have even higher hopes for Greg. I did enjoy being able to go see the ABRC meeting concurrently, and I think it was a good addition with 12-minute presentations that moved quickly. We were able to see a lot of research, including presentations by UC Davis, Connecticut Extension, Bayer CropScience, the Tucson Bee Lab, and many others.

There were a few downsides to the talks that I saw. One was that people don't seem to understand the "vibrate" or "off" functions on their phone. In one session, four people's phone rang during four consecutive presentations. Loudly. Annoyingly. And they didn't turn them off quickly, almost like if they didn't move, then no one would see who had the offensive phone. It was so rude and so distracting. I encourage everyone

to please, please, PLEASE at least put your phone on vibrate when you're in an audience of any kind. If you are watching something, you're probably not going to answer your phone at that exact time, and you can check it periodically if you are worried that you will miss a call. Most of the presenters were not too thrown off by the ringing, and didn't call anyone out, but it did deter for a few seconds.

Another issue I had was with some of the blatant bias in the presentations. There were some begging for money, some deriding bee research as a waste, and some wanting to ban all pesticides. These are not the norm but they are out there. There was a lot of anger and preconceived notions that made the presenters come off as incredibly one-sided and not seeing the bigger picture of how to work together to solve problems facing the industry instead of pointing fingers and making accusations. While I respect organizations like the new Butterfly & Honey Bee Habitat for working with what they can, other groups sought to increase their supporters by denouncing others or trying to appear superior.

The tradeshow had a lot of interesting booths this year. I enjoyed meeting Lucinda Bailey, one of the owners of Texas Ready, a company

that sells "vaults" of seeds for preppers, survivalists, or just families who want to grow their food. Since the vaults were ammo cans, it's like giving you a challenge to plant the seeds so you have an empty can to have to fill with ammo. Since one of Bobby's favorite hobbies is collecting ammo, this definitely appealed to him. I think you'll be reading more about Texas Ready from me in the future. We also talked to the new guys at Ross Rounds about how well the Sundance Pollen traps worked. Later this year, look for a full review from me on the pollen traps and maybe even the Ross Rounds. We stopped at the Bayer bee booth and commented on the presentations by Allen, Dick, Stephanie, and Dan. Annie, one of their student techs (who is fantastic in the field, if you were wondering), along with Kim and Jim were manning the booth. If you didn't get a chance to talk to Kim, she is brilliant at bee taxonomy.

At the Dadant booth, we saw Patrick and talked to him about our upcoming orders for the year. He introduced us to Gabe, and we all admired the giant smoker that wasn't allowed to smoke in the convention hall. The Drebbieville hives were also really cool. They are modeled after Slovenian hives, but with Langstroth dimensions. That means you can

Ursula with the copper embossing we purchased.





The new guys at Ross Rounds.

move them as a quad but they're also under cover. It's almost like a chicken coop for bees! In fact, I'm pretty sure you could easily create that scenario. Better Bee has a booth up next to the escalator displaying their Lyson candle molds. Their candle molds are always a step above with the quality and availability of designs. Also next to the elevator was ARK tees, where I had to buy a bright yellow sweatshirt with a teal bee. They also had an Etsy shop and a lot of really good designs. I will be buying a newborn onesie with a queen bee on it for any of my pregnant friends about to have little girls! Nearby, I stopped to check out Ursula Westervelt's copper engraving and ended up buying one. She even mailed it for me, which was nice since I'm not sure I could have packaged it so well or gotten it home safely.

The venue itself was one of my favorites. This was my second trip

to Galveston, both of which were for NABC. It was nice to leave the house with eight inches of snow and 26°, then show up in Texas and have sunny weather in the 70s. The conference center itself is perfectly sized for the meeting, especially at that time of year. The parking is underneath, and we never had trouble finding a spot. There weren't huge walks between rooms, and if you wanted to see presentations in different rooms, you could easily make the trip in the allotted time. Seating was bordering on the smaller side, but I believe that was just because of the large turnout. It's always great to have to hunt for seats rather than see large openings in the audience. The giant windows at the front of the building overlooking the ocean didn't hurt, and added a lot of bright light, making it cheerful in the open areas. The bathrooms were easy to find and everything was clean. It's surprising how those things aren't always easy to find, and it makes you

appreciate them more when you do have it available!

The area was great for the conference. There was a grocery store next door to the main building, plus a WalMart nearby. I was able to take Diet Dr. Pepper with me every day, along with a bottle of water, and a bag of blackberries, blueberries, and strawberries for snacks. Snacks make me not cranky, and everyone can appreciate that. Besides proximity, the driving itself is easy in the area, with nearly everything being on the main strip, basically following the water. It's a gorgeous drive, and almost any kind of food you would want can be found within a mile or so of wherever you might be staying or from the conference. There was a steak place called Salt Grass that was excellent, as well as a seafood restaurant named Gaido's. That particular place caught their menu offerings directly from the Galveston coast, and it was probably the best shrimp I've ever eaten - so good we went there twice! Being as it's so close to Louisiana, there's a Cajun vibe to the area and you could also stop and get a Poboy, muffuletta, or some gumbo that was fairly authentic, according to my Cajun husband.

Bobby and I didn't have a whole lot of downtime, but we did get to take in a few things. We walked down the main strip and took pictures with the Hurricane memorial, which is a little closer to home since Bobby's family lives in New Orleans and dealt with Katrina. We also took a tour of the Bishop's Palace, and I've decided that the palace would be a good design for us to build a house. I think the size and space are just about right.. -



Bobby and Patrick checking out the Dadant extractor.



Stephanie and Annie at the Bayer Bee Care Booth.



Checking out the Hurricane Memorial.

maybe not so much on the price tag. They were able to restore some of the original furniture, and the inside has been maintained beautifully. If NABC goes to Galveston for another round in the future, I definitely recommend taking a tour if you get a chance.

Overall, I think this was one of the better conferences that I remember for NABC. It wasn't too pricey as compared to some of the other recent venues (Vegas, Disneyland) while still being nice quality. Everything was pretty convenient and easy to find without sacrificing options, including having an airport close by. Having the conglomeration of bee meetings makes a larger, more diverse audience and presentation list, and really adds to the interest of the meeting. It's the only time during the year that you can see some of the people that are there, and with more groups, you're more likely to run into old friends and acquaintances, or make new ones. I hope that in the future the group continues to grow and offer conferences that have something for everyone and is enjoyable to all the attendees. **BC**

Jennifer Louque and her family are keeping bees, gardening and enjoying life in NC.

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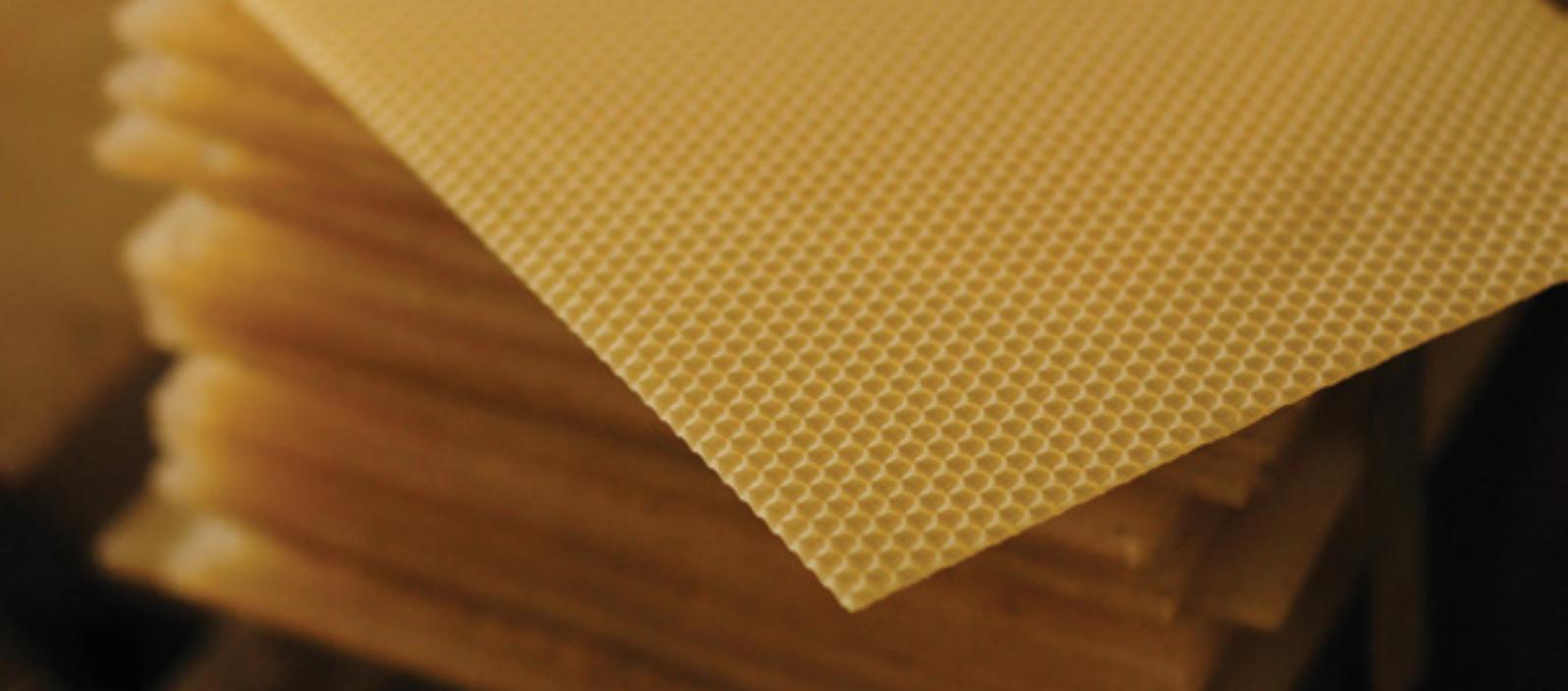


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Mountain States Foraging

Connie Krochmal

This month we'll take a look at another volume in the Timber Press series on foraging – "Mountain States Foraging – 115 Wild and Flavorful Edibles from Alpine Sorrel to Wild Hops" by Briana Wiles, 338 pages, ISBN 978-1-60469-678-3. This is a highly suitable guide for beekeepers since it profiles over a hundred edible pollinator plants. As with the other volumes in the series, many of these species can be found in other regions or have relatives who are.

This volume covers Colorado, Idaho, Montana, Nevada, Utah, and Wyoming as well as parts of Oregon, Washington, and Canada. The individual plant profiles are easy to locate and use since they're organized alphabetically by common name. There is also a comprehensive index with the common and Latin names.

The introduction contains very helpful information on a range of topics related to foraging. These include legal and ethical issues, tips on using the foods, food preservation methods, and some poisonous plants that are found in the area. The author encourages readers to become familiar with edible invasive plants and focus on harvesting those as a means of limiting their spread.

One particularly invaluable feature in this volume is the quick and easy to use, color-illustrated guide to common botanical terms that are used in the plant descriptions. The information is helpful when it comes to plant ID. The reader-friendly seasonal guide to foraging lists the plants in each of the region's common habitats from early Spring through Winter.

The extensive individual plant profiles give the common and Latin name, the plant part/parts to be harvested, plant ID guidelines, harvesting tips, when, where and how to harvest, how to prepare and preserve the food, and sustainable harvesting guidelines. When appropriate, the

author gives pertinent cautions under each species, such as potential allergic reactions or poisonous look-alike plants. The appendix provides additional sources of information.

This title has 40 or more species or relatives that have been featured in earlier *Bee Culture* articles. Now, let's consider some of the other edible pollinator plants profiled in this foraging guide. Ones that are known to be sources of honey or have the potential of sometimes bringing a crop of surplus honey are walnuts (pollen also), oxeye daisy, ephedra (pollen also), hackberry, the aspens and various other poplars, burdock, licorice, elderberry, bistort, king's crown, plantains, lilac, and thimbleberry – a type of wild raspberry.

Some of the profiled species that are sources of nectar and pollen but not necessarily surplus honey are amaranth, ground cherry, yarrow, tansy mustard, miner's lettuce, chickweed, wood sorrel, mallow, cleavers, bluebells, and watercress.

Those species that offer nectar are lettuce and pennycress. Pollen is supplied by hops, docks and the related sheep sorrel, and juniper. Ones from which bees obtain honeydew are walnuts, oaks, juniper, pines, poplars, cottonwoods, and spruce.

Of the many fine pollinator plants in this volume, I've selected several to highlight below. These happen to be great bee plants and are either found in other regions or are commonly cultivated species.

ANGELICA (*Angelica archangelica*)

We'll begin with two herbs that belong to the carrot or Umbelliferae family. Angelica is native to Asia, Europe, and Siberia where it can be found in damp places. The Latin genus name comes from the Greek 'angelos' for messenger. The plant was introduced to North America by Europeans.

Angelica is a source of nectar and pollen. This can provide a modest honey crop of 30 pounds or so per colony. The dark colored honey has a reddish tinge.

Description of Angelica

Hardy to zone three, this biennial or short lived perennial features tall, erect, upright stems. It can grow to five or six feet in height. The three parted leaves can be several feet long.

The small, whitish-green to pale green blossoms form large, round to flat umbels. These appear the second year in early Summer for about three weeks. The seeds ripen in large bunches.

Growing Angelica

This herb does self sow. It is somewhat tolerant of hot Summers. Grown from seed and divisions, angelica prefers full sun to light shade. A rich, moist, well drained soil is best for it abhors soggy conditions. Its preferred pH range is 5.0 to 7.

Space the plants three feet apart. This can be planted in the late Summer as soon as the seeds are ripe



Angelica (*Angelica archangelica*)

or in the Spring once the soil is warm. For best results, use fresh seeds for these don't store well.

To improve germination, store the seeds in the refrigerator in moist peat moss for six to eight weeks before planting. The seeds can be started indoors or direct sown outdoors. Potential problems include leaf spots and aphids.

CARAWAY (*Carum carvi*)

Native to western Asia and the Mediterranean, caraway was widely used by ancient peoples. It has been called "the oldest cultivated spice plant." Historically, people believed this plant possessed magical powers and could protect them from witches and demons as well as hair loss. Caraway was even used to treat snake bite.

Once it was introduced to America by European colonists, the herb naturalized in all states except California, Nevada, Arizona, Texas, Nebraska, Oklahoma, and from Arkansas to Florida and South Carolina.

This nectar and pollen plant can provide a small honey crop of around 20 to 35 pounds per colony.

Description of Caraway

Caraway is usually a perennial, but sometimes behaves as a biennial. Arising from a tap root, the somewhat lanky plant is two to 2½ feet in height. The first year, this bears a rosette of basal foliage. During the following Spring, a stem with alternate leaves appears.

The finely divided, nearly evergreen foliage has narrow segments. The small, white blooms



Caraway (*Carum carvi*)

Fireweed



form flat, compound umbels in June and July of the second year. Occasionally, the flowers can be pink. The crescent shaped seeds feature lengthwise ridges.

Growing Caraway

Hardy to zone three, caraway is very easy to grow from seed. Favoring full sun to light shade, this herb tolerates both heat and cold.

A light, sandy soil is ideal, but the plant adapts to most reasonably rich, average, well drained soils. The preferred pH range is 6.0 to 7.5.

Caraway is generally grown from seed, which readily sprout in one to two weeks. It is also possible to propagate this from cuttings. Usually, the plant is direct sown since it resents being transplanted due to the tap root.

The seed can be sown in Spring, late Summer, or Fall. Avoid planting this near fennel for the two herbs aren't compatible.

Cover caraway seeds 1/8 inch deep and space about ¾ feet apart. Keep the soil evenly moist to encourage germination. Potential problems include aster yellows, caterpillars, and aphids.

FIREWEED (*Chamerion spp.*)

About two hundred fireweed species occur worldwide. Sometimes semi-evergreen, the group features various kinds of plants from subshrubs to herbaceous ones. These are members of the willow-herb or evening primrose family.

Five species are in cultivation. Certain ones tend to be quite aggressive and prone to spread rather freely unless the roots are controlled. The seeds are spread by the wind.

Fireweeds can assume a range of growth habits, depending on the species. These can be upright, sprawling, prostrate, mat-like, or creeping.

The plants are typically woody at the base. Depending on the species, the foliage can be alternate or opposite, or in a few cases both. The leaves typically create spirals or clusters.

The blossoms can emerge singly in the axils or they can form terminal spikes. The four-petaled flowers come in a broad range of shades from white or pink to various purples.

Common fireweed (*Chamerion angustifolium*)

This is the most widely distributed fireweed. It is native to Europe, Asia, and North America from sea level to the high elevations. This occurs in all states except Kansas, Missouri, Oklahoma, Arkansas, Kentucky, and along the Gulf from Texas eastward to South Carolina.

It frequents various habitats, such as ditches, open woods, scrublands, forests, waste places, and especially disturbed ground. This is called fireweed because it is one of the first plants to colonize an area after a fire or when land is cleared.

Several varieties of the species can be found. Hardy to zone two, this perennial occasionally grows to ten feet tall, but is generally three to eight feet. Depending on growing conditions, the very leafy native bears a single unbranched, erect stem or a large cluster of crowded, branched stems.

The soft, thin leaves can vary in shape and size based on their location on the stem. The lower ones

can be scale-like. The upper foliage is often long and slender, but is sometimes ovate or oblong.

Overall, the leaves are two to eight inches in length. The wavy margins can be toothed.

This very floriferous species blooms over an extended season from mid-Summer until frost. The blossoms form terminal spikes, a foot in length. Those flowers on the upper part of the clusters emerge later. In a few cases, fireweed blossoms can appear in axillary clusters rather than terminally.

The cup-like, bracted, hairy, four-lobed flowers are 1¼ inch across. These contain purple sepals and inch-long, claw-shaped petals. Fireweed flowers come in a range of colors from purple to reddish-purple, pink, or magenta. White-flowered varieties are available.

River-beauty (*Chamerion latifolium*)

This species is also known as red willowherb and dwarf fireweed. It is native to Washington, Oregon, California, Nevada, Utah, Colorado, Idaho, Wyoming, Montana, and South Dakota. As the common name implies, the plant prefers moist sites, such as slopes, meadows, gravel-rich spots, and along waterways.

Hardy to zone two, this forms a mat that can be two feet in height. It features clusters of crowded stems. Two inches in length, the thick, fleshy, lance-shaped foliage is alternate.

Flowering throughout the Summer from June to September,

river-beauty bears pink or purple blooms. These emerge in the leaf axils on sparse clusters. There are also varieties with white blossoms.

Growing Fireweeds

Favoring cool climates, these carefree, frost-sensitive plants thrive with little attention. Generally, they experience minimal pest or disease problems apart from flea beetles, slugs, and mildews. Hardiness varies slightly by species.

Suitable for most soil types, fireweeds do best in a rich, well drained spot. Certain species adapt to drier soils although most favor moist conditions. They're tolerant of partial shade and full sun.

The plants are propagated by division, cuttings, and seeds. Divide the plants in Fall or Spring. These are also good times to plant seeds, which should remain uncovered. Germination takes one to two weeks.

Bee Value of Fireweed

All fireweeds are outstanding honey plants. The common fireweed is among the best honey plants for northern climates. It is a major honey source in the North, West, North Central, and the Pacific regions.

The nectar flow is affected by various factors, including latitude, altitude, and the amount of rainfall. Cool nights, and foggy, humid, warm days bring the best nectar flows, which are unaffected by wind and rain. Less nectar is produced during dry seasons.

Some sites bring excellent honey yields for years with the time period varying widely. The plants are most productive for the first five years or so before they're crowded out by other plants. The honey yield varies widely and is somewhat unpredictable. Good nectar flows can result in a huge honey surplus annually for a number of years.

The honey crop typically ranges from 50 to 125 pounds or more per colony although in some cases it has reached 250 pounds. Twenty pounds of honey can be added per day per hive. For best results, two to three hives per acre are needed.

Often receiving awards at honey shows, the top quality, mild tasting honey can be slightly spicy. It is extremely light colored – one of the lightest of all honeys. Often clear, this can also be water white, white, very light, or pale straw. Sometimes, fireweed honey has green tinges due to the greenish-purple pollen.

This is usually quick to granulate and develops fine crystals. The comb is very white and tender. **BC**

Connie Krochmal is a beekeeper, writer and plant expert living in Black Mountain, North Carolina.

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Sugar For Bees



Ann Harman

To feed or not to feed... (My apologies to Will S.) We want our honey bees to survive and live a good life but at times they are in peril from weather conditions. Prolonged drought, incessant rains, too cold or too hot at the wrong time all can make nectar scarce. Grass fires and forest fires can decimate square miles of possible forage. Winter, long and severe, keeps the bees within their nest but they still must eat to stay alive. So to keep colonies alive until conditions improve many beekeepers will want to feed their bees.

The energy requirements of a colony depend on the carbohydrate supply – honey. But if incoming nectar is scarce it will have to be replaced with a suitable food. Nectar contains sucrose along with the small amounts of the color and flavor ingredients supplied by the particular plant. Other simple and complex sugars are found but in very small amounts.

Green plants all make sucrose as a result of photosynthesis and other cycles (remember that from high school biology?). The chlorophyll and sunshine combine the atmosphere's carbon dioxide and water to form glucose, followed by other cycles to form sucrose and some fructose.

Sucrose, a disaccharide, is the main sugar transported throughout green plants. You may be familiar with maple syrup obtained from the sap of the maple tree. It is water and sucrose with color and flavor compounds characteristic of maple trees.

We call sucrose 'table sugar' or 'white granulated sugar.' Our table sugar is from the sap or juice of sugar cane or sugar beet. More about those later.

Sucrose, as such, cannot be used by honey bees or humans or even by

cows or horses. The sucrose molecule must be broken into the two simple sugars of glucose and fructose. This is done by an enzyme called *sucrase*. In older books you will see it called *invertase* but today that word is reserved for plants. Sucrase is for animals (yes, that includes bees and humans).

The enzyme, sucrase, in bees is found in the stomach (ventriculus) where digestion takes place. Sucrase is also found in the hypopharyngeal glands of foraging bees. It may also be in salivary glands. So the process of converting sucrose to the two simple sugars in honey, glucose and fructose, is started by the foraging bees.

Glucose is an important sugar. The brain cannot function without glucose. It also supplies energy to muscles. Glucose also aids functions

in body cells. What about fructose? It supplies energy but the brain does not use it. In humans fructose is actually metabolized by the liver.

Fructose, although an important sugar, can cause a problem. In order to understand that problem, we need to meet hydroxymethylfurfural. That's a ferocious chemical name, so it is called HMF. This substance is toxic to honey bees. Actually it is not good for humans either.

HMF is formed from fructose. Heating fructose causes it to form HMF. Acids, such as vinegar (acetic acid), lemon juice (citric acid) and 'cream of tartar' (tartaric acid), when added to fructose will produce HMF. Our own foods, such as fresh vegetables (green plants) do contain a very small amount of fructose. When these are cooked HMF, in minute quantities, is formed. However, the



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level in our cooked vegetables is not dangerous.

Several types of sugars are sold for bee feed:

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Sucrose, table sugar

Let's see how some of these sugars are made. Invert sugar, used by commercial bakeries, is made by one of two processes: by acid hydrolysis that produces HMF and enzymatically that does not. Unfortunately there is no way to know which process was used when buying invert sugar.

Beekeepers make invert sugar, called fondant, by boiling a solution of sucrose and water. Recipes are given for this in many beekeeping books. Unfortunately the recipes call for the addition of an acid, lemon juice or cream of tartar. The temperature for proper consistency of this cooked fondant must reach 238°F (115°C). The addition of the acid plus the high temperature causes HMF to form. An uncooked fondant can be made by just mixing sugar with high fructose corn syrup. However, HFCS can contain HMF.

High fructose corn syrup is indeed made from corn by a rather complicated process. Beekeepers usually use HFCS 55 that means 55% is fructose, 42% is glucose. As manufactured, HFCS does **not** contain HMF. The syrup leaves the factory in large metal tanker trucks. HMF will begin to form at about 113°F (45°C). The tanks full of HFCS out on the highways during hot summertime mean that the contents could easily reach that temperature and higher. Furthermore the syrup will be distributed to retailers who may place it into metal drums for dispensing or sale. If these drums are stored in the hot sun, even more HMF will form. The higher the temperature, the more HMF is formed. The longer exposed to higher temperatures, the more HMF. It is impossible for anyone to know what the content of HMF is in any particular batch of the syrup. Chemical analysis is not economical.

What about honey – the bees' natural food? Honey does contain fructose. So honey as stored in the hive by the bees will not contain HMF.

However, repeated heating or too high a temperature will produce HMF. Honey, if kept at room temperature for a very long time will contain very small amounts of HMF, not toxic levels. If honey is scorched in processing by the beekeeper it certainly could contain a larger quantity of HMF. Therefore scorched honey may not be the best choice of food for bees. Honey does supply the bees with nutrients such as some vitamins and minerals, but in small quantities. It does leave residues in the gut that must be eliminated.

Honey does have a problem that many beekeepers realize. It can contain the spores of American foulbrood (AFB). Any jar of honey from a supermarket can contain those spores, ready to infect a healthy colony. (Fortunately we, as humans, do not get AFB.) A beekeeper must know the health of the colony supplying the honey. Otherwise that honey could be a quiet fatal dose of food.

Is there anything else that bees could be fed? Let's take a trip to the supermarket, and even the internet. Wow! There is a huge selection of sweet stuff! There's Karo® light and dark corn syrup, molasses, agave syrup, sweet potato syrup, maple syrup, pancake syrups, fruit syrups. Then we see the selection of sugars: brown sugar, light brown sugar, demarara sugar, organic sugar or organic evaporated cane juice (might look a bit brownish), turbinado, palm sugar, powdered sugar (contains 3% cornstarch to prevent caking). And then we see the artificial sweeteners like Stevia and Aspartame.

Are any of those usable for bee feed? NO! Positively not! The crystal sugars have molasses giving the sucrose a bit of color and flavor. Molasses is toxic to bees as are the artificial sweeteners. Although we can eat these sweeteners without problems, the bees cannot. The Karo® light corn syrup contains vanilla and salt making it unsuitable for bee food. Dark syrups can have molasses as well as other coloring and flavoring substances. The bee's simple digestive system can process the sucrose from plant nectar. The very small amounts of color and flavor compounds in nectar are not in toxic quantities.

So what is the best carbohydrate to give our bees when they are

short of incoming nectar or have insufficient stored honey?

SUCROSE. White granulated sugar, table sugar. It is actually the purest, cleanest food in your home! It is exactly one substance – sucrose. It is completely digested by the honey bee, leaving no residue in the gut. Therefore in cold climates when bees cannot take cleansing flights easily or often, there is no buildup of residues in the gut. Sucrose is stable; it does not decompose. Kept dry it will last for countless years.

As mentioned earlier our table sugar, sucrose, is obtained from sugar cane and from sugar beets. The sugar from each is identical – both are 99.95% sucrose. The 0.05% difference is from processing, from using different clarifying agents. However these are not toxic to bees or humans. They are perfectly safe, ordinary inorganic compounds.

I can hear someone yelling – WAIT A MINUTE! Sugar beets are GMO! That has nothing to do with the sucrose molecule. GMO affects proteins in a plant. Sucrose is not a protein. The sucrose molecule is not affected by any genetic rearrangement – it would not be sucrose if it were affected.

Sugar syrup, a liquid, is suitable except in the cold of Winter when the bees are clustered. They cannot remove the water from the syrup very well. There is one easy way to feed sucrose as a solid if mid-Winter feeding is necessary. This recipe is quick and easy, and makes use of the metabolic water from the bees to make the sucrose available.

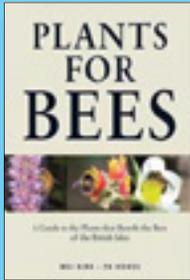
10 pounds of white granulated sugar
8 ounces (one measuring cup) of water

Mix well – you now have 'wet sugar.' Make slabs on wax paper or plastic wrap to fit under the inner cover. Let them sit at room temperature overnight. In the morning they will be as hard as a brick. Peel off plastic wrap before putting on top bars.

A well-fed bee is a happy, hard-working bee. Understand your climate and keep an eye on your weather. Feed if necessary. Your bees will appreciate that attention. **BC**

Ann Harman lives, keeps her bees and writes for Bee Culture at her home in Flint Hill, Virginia.

Spring into action with a book from Bee Culture's Book Store

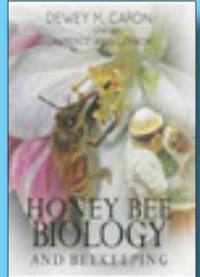


X184 Plants For Bees

Edited by W.D.J. Kirk and F.N Howes. If you want to know what bees like to eat, mostly honey bees, but bumble bees, solitary bees...all kinds of bees, this is the book you want. 8" x 10" & 311 pages. **\$49.95**

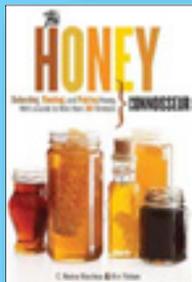
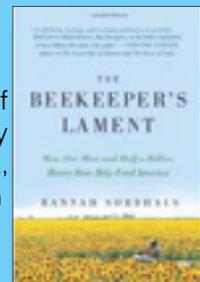
X70 Revised Honey Bee Biology and Beekeeping

The best book on honey bee biology and how-to beekeeping for the beginner or intermediate level there is. Dewey Caron & Lawrence Connor, 355 color pages. Hard cover. 9"x12". **\$50**



X176 The Beekeeper's Lament

Hannah Nordhaus. The story of Miller Honey Company, migratory beekeepers from North Dakota, Idaho & California. 288 pages. **\$20**

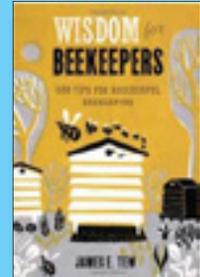


X181 The Honey Connoisseur

By Marina Marchese & Kim Flottum. Explore how honey is made by the bees, harvested by the beekeeper. Examine 30 common & exotic honeys. Learn honey tasting, and a bit of the dark side. 208 color pages **\$25**

X190 Wisdom for Beekeepers

By James E. Tew. A beautifully presented collection of 500 tips for keeping bees. Hard cover, color throughout and 288 pages. **\$25**

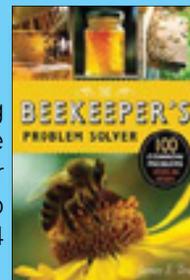


X185 Understanding Bee Anatomy

A full guide by Ian Stell. 200 full, stunning color pages. Photos and art like nothing ever seen. 13 chapters on development, head, thorax, abdomen, queens, drones and workers, and all their systems. **\$45**

X198 The Beekeeper's Problem Solver.

By Jim Tew. *Bee Culture's* long time columnist takes a bit more time and solves all of these problems for you. Tips, tricks and information to help every beekeeper. Soft cover, 224 pages. **\$20**



To Order Visit
www.BeeCulture.com
All Domestic shipping included in the cost!

Letters From A Beekeeper's Wife –

The Farm, March 1, 1917

Dear Sis,

Rob is making out the order for new beekeeping supplies for this year, and while he does that I may as well write to you. He has pulled his front lock down over his eyes in the usual way when he is disturbed. We have both been groaning over the \$300 that we have to put into supplies – we are buying 100 new hives among other things, for you know we expect to start another beeyard this Spring. (Three bucks a hive! Can you believe it?) That town lot that Rob's father bought years ago, when he thought the village would develop toward the west, has never been worth anything, but Rob thinks it will be a good location for bees and it is convenient enough to our other yards to make it feasible. Fortunately our \$300 worth of supplies does not have to be paid for entirely in cash, for we have a considerable quantity of beeswax to turn in, to be made into foundation. Rob will feel differently about this investment by Fall, and is really quite ready to spend the money now.

Would you believe that beeswax would make a more stable currency than gold? It really has changed less in value in the last 50 years than gold has, so I'm thinking I had better write to Washington and have our standard changed to beeswax. Think how nice beeswax coins would be to carry about; and wouldn't they be pretty with a skep stamped on one side and Her Majesty, The queen on the other, symbols of royalty and industry! A dollar weighing over three pounds might be a little awkward though! Too bad the modest bees could never know their greatness. Surely no king whose head appears on coins can trace his ancestry as far back as the honey bee. You know fossil bees have been found which indicate that they were living in colonies when the cave man was using stones to sling at his wife. (This kind of remark makes me wonder if "Mary" was really a man.)

I wonder if Grandfather Cave Man was stung when he stole honey from the wild bees of the forest to carry home to his offspring. Of course he would have to promise to bring the children home some sweets on his return from a hunting trip, and of course the bees would have to furnish them! Doesn't it make you humble to realize that these tiny insects in that early age had learned how to live in communities and to divide their labor, problems still unsolved satisfactorily for us? They were ahead of us too in the matter of building their homes. I don't believe you will find such economy of material and space, combined with strength, anywhere but in the honeycomb. The hexagonal cells, back to back and side by side, row after row, are marvelously fine and beautiful, and practical as well, for the material is waterproof and tough, yet plastic enough to mold.

Personally, though, I am just satisfied to be a member of the blundering human race that is still experimenting on building materials and so many other things. It might be a trifle monotonous to have double rows of apartments, all the same size and color, backed up together on uniform streets.

It is plain to be seen that our friends the bees do not go in for artistic variety – stil they are spared the fantastic and grotesque buildings that some of our neighbors force upon us occasionally. Remember the tower on old Mr. Tomlinson's house that Father used to call the wen?

Rob says it's time the children were in bed. (Then why doesn't he put them there?) They have been popping corn and pouring honey syrup over it. It's very sticky but delectable, and I shall stop writing to have some. Wish you were here to help crunch.

Your loving sister,
Mary.

Sunny And Chair

Alan Guebert

The chairman gaveled the Ag Committee to order.

"We're here today," he announced in his best radio voice, "to rapidly confirm our President's nominee for secretary of agriculture. He is, like most us, self-made, rich, manly—"

"Mr. Chairman!" interrupted a female voice from the far side of the horseshoe-shaped dais. "What are you talking—"

The sharp rap of the chairman's gavel shattered the interruption.

"Order!" thundered the chair. "I have the floor! What's more, I have my rules and my facts and we will follow both as long as I am chairman!" Another rap from the gavel seemed to silence the whole world.

"Now," continued the still angry chairman, "I ask the gentle lady from the great state of Wherever to cork it unless she and her members want to do right now what agriculture's real friends came here to do later: approve this candidate and save us valuable time and her another Valium!"

A low murmur began to rise in the packed hearing room. It was frozen in its tracks, however, with a climate-changing stare from the chairman.

"Mr. Sunny," the chair called out, "if you are ready, the Committee will now hear why we will approve your nomination."

Mr. Sunny was ready. He was no stranger to public testimony having served two terms as the Republican governor of one of the nation's bigger cotton, poultry, and football states. So, on cue, he leaned forward.

"Mr. Chairman," he began, "Ranking Member, committee members, and fellow cogs in the global agriculture supply chain. I begin by humbly and modestly noting that if one can run a tractor, a chicken barn, and an off-shore, derivatives-based futures trading firm, he can certainly run the United States Department of Big Agriculture."

He paused to look up and quickly eyeball each committee member before adding, "I am that one."

The chairman smiled. His boy had made a great start so his mind sped back to a quail-hunting trip he and Sunny had enjoyed the week-end before.

"... And, in closing," said Sunny, firing a wake-up shot to the chair, "my experience in the big-dog-eat-big-dog world of global grain and fertilizer merchandising affirms my bona fides to run USDA and, ha ha, even the Humane Society—if any of you folks ever need a tiny favor."

A lame silence followed the lame joke; the chairman coughed to fill it.

"Mr. Sunny," he asked, "does this committee have your assurance that any former or future dealings with agribusiness will have no influence on any decision you make as our next secretary of agriculture?"

Sunny and the chair had rehearsed this question while hunting so the answer was still clear in his mind. "Not just my word, Mr. Chairman," Sunny said, "but my solemn word." His voice cracked on "solemn."

"So, there are no free suitcases in your closet and no free football tickets in your pocket?" asked the chair in an obscure reference to the last USDA chief, a Demopublican, from a grits-and-gravy state.

A tight-lipped Sunny shook his pink, hound dog jowls right to left before announcing: "No, sir."

"Well, then," said the chairman as he grabbed his ruling gavel, "having been assured this nominee can ably run our beloved Department of Big Agriculture, I move that we declare, by acclamation, Mr. Sunny be recommended for full confirmation."

Dozens of voices suddenly screamed "Mr. Chairman! Mr. Chairman!" Not one, however, was louder than the chair's that shouted, "All in favor say 'Aye!'"

A loud crack of the gavel followed and then: "The 'Ayes' have it!"

And they did.

Later, in his small, hideaway office, the chairman handed Sunny a glass half-full of brown liquid, then poured himself one. Each took a small sip and smiled.

"Well," said Sunny, "you did it."

"All I did was speed up the process," the chair correctly observed, "you were a shoo-in." He paused, then asked: "You're not going to disappoint me, are you?"

Sunny looked into his glass for the right answer. A few seconds later he shot a sly grin toward the chairman and crooned, "I got you, babe."

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Don't Worry Bee Happy

I was worried . . . about being stung for the first time on a beautiful last dusk of June.

Herr Ruff, the forest, wore no protection as he pulled out the hive frames one by one, explaining who's who – those large ones those are the drones, look for the white dot 2015's birthmark beekeepers give their queen.

There, there she is near the bottom of the middle frame!

Oh majestic queen tell me the names of each as you lay your 1200th egg!

It happened then a sharp prick on the inside of my left ring finger, not sharp enough to drop the frame, just sharp enough to communicate she was mad, and who wouldn't be when door was shut before the last most efficient workers returned from foraging, your home upheaved and strapped to the back of a jeep as it bumped along five km, forcing you to hang onto every honey comb every cell to protect your eggs, your larvae, your pupae, your nation you spent 1/3 of your life building.

Two weeks here with me and you seem satisfied, if not happy – are you? Herr Ruff said it would be like a vacation home your new hive freshly varnished with natural linseed oil.

Today I sat and watched several foragers land at the entrance, legs loaded with fresh golden pollen, scurry inside.

I imagined their waggle dance.

That made me very happy . . .
Susan Holiday

GLEANNINGS

MARCH 2017 • ALL THE NEWS THAT FITS

OBITUARIES

Walter L. Gojmerac, age 91, died on Saturday, December 17, 2016, at BrightStar Senior Living in Madison. He was born April 8, 1925, in Rib Lake, Wis., son of George and Mary (Yarnovich) Gojmerac.

After graduating from Rib Lake High School in 1943, Walter joined the U.S. Marine Corps and took part in the Battles of Saipan and Iwo Jima. Thanks to the GI Bill, Walter furthered his education at St. Mary's College, Winona, Minn., and earned his B.S. at UW-Madison. After teaching high school biology, chemistry and general science in Casco, Wis., for two years, he continued his education and received his M.S. from Marquette University and his Ph.D., in 1955, from UW-Madison. A mutual friend introduced Walter to his future wife, Eleanor Dykstra, at St. Paul's University Chapel, where they were married two years later on July 30, 1955.

As an entomologist employed by university and industry, his career took him to North Dakota, California and Iowa. In 1965, he was hired by UW-Madison, as a professor, and assumed responsibilities with the UW-Extension for educational programs in the area of insects affecting man and animals and beekeeping. Walter was fortunate to be able to combine his hobby of beekeeping with his profession. He was the author of many scientific, technical and popularized articles on insects as well as books on beekeeping. His career gave him the opportunity to travel extensively in Wisconsin, throughout the United States, and to Brazil and Bulgaria.



He has received numerous awards and special recognition for work in his field. He retired in 1993.

Walter was a faithful member of St. Maria Goretti Parish for 51 years. Family, both immediate and extended, was a top priority throughout Walter's life. He enjoyed attending his children's and grandchildren's many concerts, programs, and 4-H activities. Along with beekeeping, he also enjoyed gardening, woodworking, fishing, reading, and meeting with retired co-workers and former Marines. His lifelong thirst for knowledge made him a formidable debater as he tried to educate by taking an opposing view. Walter's diverse tastes included opera, Hee Haw, the Wall Street Journal and his homemade "wine." He required his children to practice recycling and energy efficiency before it was the norm.



Donald B. Guinness, 88, rural Abercrombie, ND, passed away Saturday, February 4, 2017, at Rosewood on Broadway, Fargo, ND.

Donald B. Guinness was born on February 25, 1928 to Arthur S. and Adelia (Satter) Guinness of Abercrombie, ND. He was baptized and confirmed in the Christian Faith and he graduated from Abercrombie High School in 1946. He also graduated from North Dakota State College of Science, Wahpeton, ND with a degree in Diesel Mechanics.

He continued farming with his brother, Gordon until he was called into military service in 1952. He graduated from Army Diesel School and was shipped to Korea where he helped work on maintaining the heavy equipment used in the building of airstrips in Pusan, Korea during the war. These heavy machines were removing sand from the ocean to build the air strips.

He was honorably discharged from the Army in 1953, and returned home to continue farming with his brother.

He attended NDAC (now NDSU) several years during the winter quarter, which he enjoyed very much. It was at this time that he met his future bride, Alice Bjorklund, of Rich-

ville, MN. They were married in 1955 and lived on their home farm in rural Abercrombie for 60 years. In this union five children were born and raised: Peter, Mary, Sonja, Arthur and Sarah.

He farmed continually until the early 1980's and then transferred his talents and abilities to beekeeping. It was at this time he invented and patented the Dakota Guinness Uncapper, which is still being sold world-wide today.

Donald's honesty and fair dealings were well-known throughout the industry. At 88½ years old he was still building machines and farming his own land, which he thoroughly enjoyed.

Donald was active in the American Legion at Abercrombie. In later years he was a very active member in the Gideon Organization, giving Gideon presentations to various churches in Richland County. In addition, he was also involved in the Gideon Jail Ministry in Wahpeton, ND.

Donald was a man of faith, a man of his word and an eternal optimist who loved his family, his friends, his community and his country. His family will cherish the memory of their beloved Donald.

**Have You Seen The Newest
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SOUTH AFRICAN BEEKEEPER SAVES A CRICKET MATCH

A South African beekeeper saved the day when a swarm of bees brought an international cricket game to a halt.

A crowd of more than 20,000 people was on hand as the swarm invaded the Wanderers Cricket Ground pitch in Johannesburg and brought an abrupt halt to South Africa's game against Sri Lanka.

The players took evasive maneuvers, lying flat on their bellies waiting for the bees to pass.

But the bees decided to stay, landing on a helmet on the turf.

The groundskeepers tried coaxing the swarm into a wheelie-bin and then dispersing the bees with a fire extinguisher. Neither worked and the groundskeepers were left clueless.

The match delay reached the hour mark.

Some 20 minutes away, local beekeeper Pierre Hefer in front of his TV watching the situation unfolded.

When he saw the fire extinguisher used, Hefer, a beekeeper for three years, said he had to act.

He donned his full bee-keeping kit – overalls, helmet and boots – grabbed his equipment and raced to the cricket ground.

There, security staff had no problems letting him park his car at the front gate and enter the grounds.

“I think they saw me in this outfit, noticed all the equipment and reckoned I must be what I say I am, and with play stopped, they let me in,” Hefer told reporters.

“You see, you might get rid of them for a bit, but they'll come back, I thought they might be able to use my expertise.”

Hefer used a home-made hive and successfully captured the bees. He used honey combs to attract the bees as he did not have a queen bee.

His efforts prompted rapturous applause from the big crowd.

“I never thought in my lifetime that I would have an audience like this in front of 20 000 people,” he says. “When I arrived on the field in my uniform, there was a loud cheer and it was definitely 15 minutes of fame.”

Alan Harman

WISCONSIN HONEY QUEEN

The Wisconsin Honey Producers Association is proud to announce that **Emily Schalla** was selected as the 2017 Wisconsin Honey Queen at their annual convention in Fond du Lac. Emily is the daughter of Larry and Susan House of West Bend, Wisconsin. She is a senior at the University of Wisconsin – River Falls, where she is majoring in Agricultural Studies with a Soil Science Emphasis and a Conservation Minor.

Emily will spend the next year promoting the beekeeping industry in Wisconsin. She is available to speak with civic groups and appear at fairs, festivals, and farmers markets. She will also give presentations in schools about honeybees and the beekeeping industry. In January 2018, Emily will represent Wisconsin at the American Honey Queen competition at the American Beekeeping Federation Convention in Reno, Nevada.

Follow Queen Emily's activities on Facebook at Wisconsin Honey Queen Program.

To schedule an appearance with Wisconsin Honey Queen Emily Schalla, contact Mary Kettlewell at 414.429.5502 or wihoneyqueen-program@gmail.com. All appearances are free of charge.



NOT JUST TASTE WHEN IT COMES TO POLLEN

Bees use a variety of senses and memory of previous experiences when deciding where to forage for pollen.

Researchers at the University of Exeter in the United Kingdom believe pollen-collecting bees do not base their foraging decisions on taste alone, but instead make an overall sensory assessment of their experience at a particular flower.

Bees do not eat pollen, but carry it back to the nest via special sacs on their legs or hairs on their body. This makes it difficult to understand how bees judge whether the pollen a flower produces is nutritious enough for their young.

Co-author Natalie Hempel de Ibarra, an expert in insect neuroethology at Exeter's Center for Research in Animal Behavior, says it's a question that has puzzled researchers for a long time – what exactly bees look for when they collect pollen from flowers?

“It seems that bees don't just respond to a single nutritional compound in pollen, such as crude protein content, but to a range of sensory cues in pollen and flowers,” she says. “They also form memories for locations and types of flowers that they have visited which affect their foraging decisions.”

“We need more research that considers the behavior and neurobiology of bees to understand when

and why they prefer some plants and some pollen over others.

“A breakthrough in this area could advance our efforts in both biodiversity conservation and crop production.”

The Exeter review, published in the journal *Functional Ecology*, examines existing evidence on how bees use their senses, previous experience and – in the case of social bees – feedback from the nest to decide where to gather pollen.

“Our review is unique in considering pollen foraging from an individual bee's perspective, asking which senses bees use to decide which flowers are worth visiting,” says first author Elizabeth Nicholls, a former PhD student at the University of Exeter and now a postdoctoral research fellow at the University of Sussex.

“In our review we suggest that although bees may taste pollen during collection and use this nutritional information to guide their choices, they are also likely to pay attention to the strong odor and visual appearance of both pollen and the flower itself.

“For bees that live together in colonies, information passed on from the other bees in the nest, either via chemical cues or even special 'dances', may also be important in influencing their pollen-collecting behavior.” – *Alan Harman*



A honey bee foraging for pollen. (Photo by Elizabeth Nicholls)

It was one of those March days when the sun shines hot and the wind blows cold: when it is summer in the light, and winter in the shade.

~Charles Dickens (1812–1870), Great Expectations

CALENDAR

◆INTERNATIONAL◆

ApiSlovenia will be held in Celje March 12-13.

For more information about ApiSlovenia visit www.ce-sejem.si or contact Nino Ermenc Pangerl, +386 3 5433 200, nina.ermenc@ce-sejem.si.

45th Apimondia International Congress will be held September 29 to October 4 in Istanbul, Turkey.

For more information visit www.apimondia2017.org.

◆ARIZONA◆

9th Annual Organic Beekeepers Chemical Free Conference will be held March 3-5 in Oracle at the YMCA Triangle Y Ranch Camp and Retreat.

Speakers include Michael Bush, Laura Ferguson, Don Downs, Karen O'Brien and more. The cost is \$225/person which includes lodging and meals.

For more information visit www.tucsonymca.org or www.groups.yahoo.com/group/organicbeekeepers/ or contact Dee Lusby, evenings at 520.398.2474.

◆CONNECTICUT◆

Back Yard Beekeepers Association 2017 speaker schedule - March 28, Carl Jurica; April 25, Frederique Keller; May 23, Christina Grozinger; September 26, Tom Seeley; October 31, Kirk Webster; November 14, Jennifer Berry.

For information visit www.backyardbeekeepers.com.

◆DELAWARE◆

EAS 2017 - University of DE Newark, July 31 - August 4.

Speakers include Larry Connor, Mike Embrey, Maryann Frazier, Clarence Collison, Allen Hayes.

For information visit www.easternapiculture.org.

◆GEORGIA◆

Queen Rearing Classes will be held April 28-29 and again May 19-20 at Honey Pond Farm in Comer Georgia. Jennifer Berry is the instructor.

The cost for two days is \$300/student. Class size is limited. No experience is necessary.

For more information visit www.honeypondfarm.com.

Beekeeping Institute will be held May 10-13 at Young Harris College in Young Harris, GA.

Lectures, workshops and demonstrations from local, regional and national speakers will be held. There are also hands on training and honey judging and more.

For more information visit www.ent.uga.edu/bees.

◆ILLINOIS◆

LCBA Bee Seminar will be held March 18 in Mettawa at the Grainger Company.

Speakers include James Amrine, Gordon Wardell, Jon Frank, Dave Hackenberg.

For more information www.mettawabeeSeminar.com.

◆KANSAS◆

The KS Honey Producers will hold their Spring meeting at the Ramada Convention Center in Topeka, March 10-11.

Keith Delaplane is the guest speaker. The theme is Second Year Beekeeping and Beyond. For hotel reservations call 785.234.5400 and mention KS Honey Producers.

For information visit kansashoneyproducers.org or contact Joli, 913.593.3562 or joli@heartlandhoney.com.

◆MASSACHUSETTS◆

Worcester County Beekeepers Association Conference will be March 4 at Quabbin Regional High School, Barre.

Speakers are Tom Seeley and Dennis vanEngelsdorp. Visit www.worcestercountybeekeepers.com.

MA Beekeepers Association will hold their Spring meeting March 18 at the Topsfield Fairgrounds. Registration is required. Speakers will be Peggy Garnes and Michele Colopy.

For more information visit www.massbee.org.

◆NEBRASKA◆

University of NE Introductory Beekeeping will be held March 25 at UNL Agricultural Research Development Center, Mead and April 8 at UNL East Campus Pollinator Garden, Lincoln.

Instructors are Judy Wu-Smart, Natalia Bjorklund.

Tuition is \$60/person includes materials and lunch. \$30 for each additional family member. Register by March 17. For information Dustin Scholl, dscholl3@unl.edu.

◆NEW YORK◆

Geneva Bee Conference will be held March 18 at the Scandling Center in the Vandervort Room at Hobart and William Smith Colleges.

Kent Williams and Dewey Caron will be the speakers.

For information visit www.GenevaBeeconference.org.

Southern Adirondacks Beekeeping Assembly will be held March 4 at TECSMART, Malta.

Speakers - William Hesbach, Peter Borst and Dale Hill.

For more information contact alavitable@yahoo.com.

◆OKLAHOMA◆

The Oklahoma State Beekeepers Association will hold its Spring conference March 4 at the First Baptist Church, Duncan, 901 W. Ash Ave.

The SW Oklahoma Beekeepers Association will hold their meeting March 3 at 7:00 p.m.

Jeff Armstrong, featured speaker for both meetings.

For information contact Pat Tickle, patokbees@gmail.com or 580.795.4619 or visit www.okbees.org.

Northeast Oklahoma Beekeepers Association will present the Big Bee Buzz March 31 - April 1 in Tulsa.

Speakers include Marion Ellis, Phil Craft, Katie Lee, Megan Mahoney and Beth Conrey. The cost is \$35.

More information online at NEOBA.org.

◆TENNESSEE◆

Northeastern TN First Honey Convention will be held March 3-4 at Walters State College in Tazewell.

Speakers include Mike Studer, Lynda Rizzardi, Aaron and Kellie Burns and many more.

Visit www.facebook.com/easttnhoney or contact HONEY.convention@gmail.com, 423.944.3230.

◆VIRGINIA◆

Highlands Beekeepers Association will hold the 2017 Honey Bee Symposium April 18 at the Southwest Virginia Higher Education Center in Abingdon.

Speakers are Jerry Hayes, Sam Comfort and Jerome Blankenship. The cost is \$40 includes lunch.

For information contact 276.676.6309 or visit www.highlandsbeekeepers.com.

The 6th Annual Mid-Atlantic Organic Honey Bee Convention will be held July 15 at American Legion Post 242, 21 J.B. Finley Road, Sandston. The cost is \$50/person or \$90/family.

For more information visit www.maohbc.com.

◆WEST VIRGINIA◆

The WV Beekeepers Association will hold their Spring Conference April 21-22 at Oglebay Resort in Wheeling.

Speakers include Jamie Ellis and Phil Craft.

A block of rooms at the resort has been reserved. Must book by March 21.

For information contact Steve Roth, 304.242.9867 or visit www.tristatebeekeepers.com.

◆WISCONSIN◆

Central WI/Marathon County Beekeepers Association will hold their Annual Conference March 18 at the Northcentral Technical College, Center for Health Sciences Building in Wausau. Price by March 1 \$9, after \$59.

Speakers Solomon Parker, Mel Disselkoen, Adrian Quiney, Rich Schneider, Alex Zomcheck.

Contact Rachel Alwin, 715.803.1230 or ce@ntc.edu.

◆WYOMING◆

The Wyoming Bee College will be held March 18-19 at the Laramie County Community College, Cheyenne.

Featured speakers are James Tew and Les Crowder and others. The cost is \$75 which includes meals.

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Last Fall on my gal Marilyn's birthday trip to Cortez, Colorado, we visited the Pueblo cliff dwellings in Lion Canyon on the Ute Mountain reservation, adjacent to Mesa Verde National Park. Nobody lives on this part of the rez. I asked our Ute guide Bev about beekeeping. She said there wasn't any. When we arrived at Lion Canyon, I figured we were at least 40 miles from any managed beehives.

But there were bees on the rabbit brush on the canyon rim. In the age of *Varroa*, these were almost certainly true survivors. God bless 'em!

Marilyn and I decided at the 11th hour that we ought to go to the 2017 North American Beekeeping Conference this week in Galveston. This is a joint meeting of the American Honey Producers Association, the American Bee Federation and the Canadian Honey Council. For us, this was a complicated decision that factored in, among other things, our lower middle class budget. But Marilyn was ready to get the week off from her school bus driving route. TJ would take care of her blue heeler Pepper. All that remained was to line up a chicken and goose sitter. Howard always comes through for us, and we return the favor. He sits more for us than we do for him, so we generally owe him.

We dropped by Howard and Margo's to drop off a Christmas card. But before I got around to telling Howard about Galveston, he said, "Don't forget. We're leaving town on January 11 for two weeks."

"Howard, I'm glad you reminded us," I deadpanned. I looked at Marilyn. She gulped and looked back. Howard had given notice clear back in November. We'd pledged our word. We were on the hook to chicken and cat-sit the same week we'd planned to go to Galveston. But we never let on to Howard.

This time Marilyn made the sacrifice. "You need to go on this trip," she told me later. "I'll chicken sit. I won't have to take time off from work, and I can use the money."

You need to understand. Marilyn is the traveler. I'm more the homebody, when I can get away with it. But she knew this time I had a bunch of reasons to go.

I booked my flight on Frontier. Very reasonable! The convention hotels were full, but Marilyn found a cozy Airbnb 10 minutes by car from the convention center. The amiable owner said there was a bike I could borrow, or maybe she could shuttle me to the convention.

All I needed was to drive 160 miles, over Vail Pass, in January, in a 30-year-old-Toyota 4WD, to catch an 8:30 a.m. flight out of Denver. Hopefully there wouldn't be a blizzard that day.

Maybe there was a better way. Marilyn and I put our heads together. I could leave early the day before, catch the local bus into Glenwood Springs, then the once-daily, 7 a.m. bus from Glenwood to Denver. Sleep at Marilyn's angelic sister Nancy's place in the cozy guest bed. Then, a 5 a.m. light rail trip to the airport. This wouldn't be so bad. Marilyn convinced me.

I'd still have to get through security and find my gate. That might sound easy to you, but airports are not my best trick. And my flight needed to land on time in Houston, in order for me to catch the mid-day shuttle to Galveston. Tight airport schedules can be a recipe for frustration. We all know that.

There's a commercial beekeeper I need to mend some fences with. I called Paul to learn if he thought this mutual friend might be going to Galveston. Paul said he wasn't sure. Then it hit me. I said, "You're not going to the conference yourself, are you?"

"Yeah," he said. "This is a meeting of the ABF, the AHPA, and the Canadian beekeepers. We might not have a meeting like this one for a long time."

"When are you flying down?" I queried.

"I'm driving," he said. I leave at noon on Monday, and I should be there by Wednesday morning."

I was speechless. How is it we'd never thought to connect on this trip?

We were leaving the same day. At first I thought I'd ask Paul for a ride to Denver, but then it hit me. He needed a co-pilot for this 1,250 mile journey. When I called back and offered to help with the driving all the way to Galveston, he didn't hesitate to say yes.

Paul's not staying for the whole conference. I am, so I'll still fly back. I'll take a beating on the non-refundable flight down there and the shuttle, but so what? How often do you get to take a road trip with a friend?

I won't have to deal with the charming folks at TSA, at least not going down there. I won't have to worry about sleeping through any middle of the night alarms. I won't have to stress about catching my shuttle. Instead, it'll be me and Paul on the open road.

We leave tomorrow. The Denver forecast is for blue skies, and from there it's all downhill to Galveston. But first we have to get over Vail Pass. They're calling for a blizzard.

Ed Colby

A Road Trip

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